

WIN**£1,000**of games
software
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COMPUTER *EXPRESS*

FIRST NEWS • FIRST REVIEWS • BEST BUYS • YOUR WEEKLY GUIDE

THIS WEEK

AMIGA

Where can you get 8 channel sound for only £10?

ATARI

First facts on that new CD-ROM drive

PC

The 1 Gigabyte hard disk arrives **PLUS** Pick up a power portable

MACINTOSH

Where are the best places to go for free software?

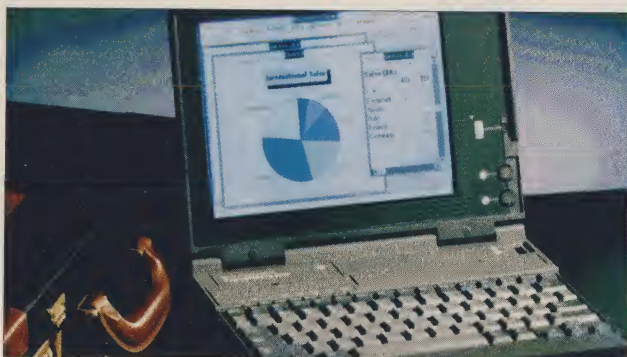
GAMES

First review of Cybercon 3

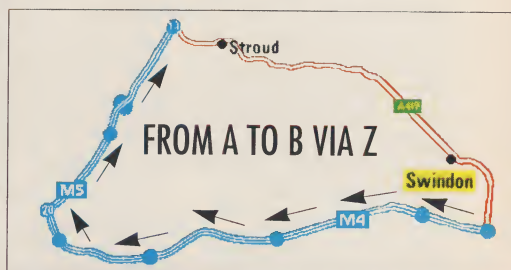
ACORN'S SUPER A3000



Power-packed Archie for less than £1000! see p5

Psion says "WE ARE THE WORLD LEADERS"
But are its new Organisers? Exclusive news page 8**PLUS**
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& 40 PAGES OF**SHOPPING**
EXPRESS**BARGAINS !!!**

NOTEBOOKS:

Why these superslim PCs are
all set to take over the world**DOOR TO DOOR:**
The worst program ever?**future**
PUBLISHING
Your guarantee of value

frontend

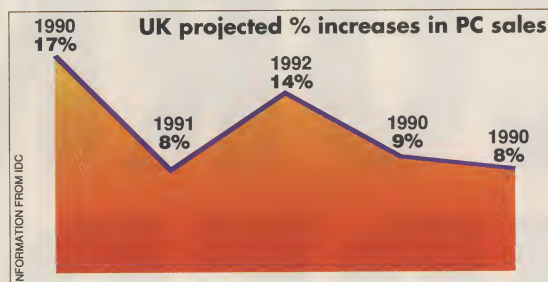
edited by Colin Campbell

PC SALES SLOW DOWN

Growth in the once booming British and European PC markets is slowing down at a considerable rate. That's the finding of leading market research firm IDC which last week published detailed figures on the state of the European PC scene.

The report predicts that the European IBM compatibles market will grow by only six per cent this year, as opposed to eight per cent last year. And the long term outlook is worse for manufacturers as the increase in value is expected to dip from 15 per cent to 12 per cent.

Sales of the PC in Britain increased by 300,000 between 1989 and 1990, but are expected to increase by as little as 70,000 next year.



A resulting price slump on 486 PCs will boost sales next year, but this is expected to be short lived.

Simon Pearce, IDC's European PC consultant commented: "The days of rapid growth now appear to be over. User demand for PC power is already largely satisfied and long term market growth can be measured in single units."

Pearce says that users are now less willing to spend money upgrading to faster machines, and are more likely to exploit the hardware at their disposal. This, argues Pearce, is reflected in a reluctance to upgrade from 386 based PCs to more expensive 486 PCs. "The 486 is a classic case of technology moving far ahead of the actual use," he concludes.

Computer rebuilds Pompeii

IBM Italy has produced a computerised guide to the ruins of Pompeii, site of a terrible volcano eruption 2,000 years ago.

The 140 square mile area around Mount Vesuvius has been mapped showing where all archaeological treasures were uncovered. There are also thousands of text entries on individual finds and some 9,000 digitised colour images of artefacts.

Using the information the computer system has been able to plot a convincing map of Pompeii in the First Century AD, and historians say the findings will help them understand what life was like in



the ancient Roman city. Stefano Bruschini of IBM Italy explained: "From the very beginning we aimed to achieve something more than a mere catalogue of finds. The computer screen can act as a window onto texts, archaeological and technical maps and images of frescoes and iconographic sources. We sought to create a knowledge environment of Pompeii and its environs."

Visitors to Pompeii and archaeologists will be allowed to make full use of the interactive system. ■



Talking sandwiches and singing bottles of beer might sound like the makings of a weird hallucinogenic experience, but new technology could make chattering foodstuffs a reality within a few years.

Industry minister Lord Hesketh has backed plans to develop bottles and food packaging which could give

buyers verbal assurances that it is the genuine article or that it is fresh.

The initiative is being spurred on by the threat of counterfeit products coming onto the market as international trade restrictions are loosened.

The technology is a mix between a biologically triggered alarm and standard speech synthesis. In this way a sandwich could say "warning - I am past my sell by date", or a bottle of whisky could boast "I am genuine Scotch".

Products could also advertise themselves on supermarket shelves, but the prospect of a cacophony of competing sandwiches is hardly appealing. ■



Price of victory

Sega games players hunting for the latest intelligence on their favourite puzzles, shoot-'em-ups and adventures should check out the *The Complete Sega Solution*.

It's a hints and tips book for the Master System and Megadrive detailing devious cheats from 200 top games. Authors Richard Monteiro and Dominic Handy reckon they've tapped into all the secrets which programmers like to keep to themselves.

It'll be out at end of this month for £9.99 from The Words Works (0225 765086). ■

EAT AND ENJOY!

Maxwell backs CD-I

Robert Maxwell has a habit of putting himself about. You'll find the portly profiteer popping up wherever there's a few bob to be made.

Now the media magnate has decided to get in on the multimedia revolution. A joint-venture publishing company called Maxwell Multi Media is to produce self-teach language courses on Philips' Compact Disc Interactive (CD-I) standard.

Maxwell's latest venture will be aided by his subsidiary company Berlitz Publications, famed for travel guides and recorded language courses.

Maxwell enthused: "The combination of Berlitz, the world's premier language instruction company with Philips, the inventor of CD technology, creates a formidable partnership of software publishing and



consumer electronics experience to be based on this new multimedia format."

CD-I was developed by Philips in conjunction with Sony and Matsushita. It integrates video, audio, graphics and text through a dedicated hardware system on the standard CD format. CDI, along with Maxwell's education CDs, should be here by 1992. ■

BEDEVILLED BY BUGS?



Most of us have come across the odd piece of software plagued by a few bugs - but what of a program featuring no fewer than 185 of the horrid pests?

GardenTech of Redondo Beach, California has launched *Bugs*, a computerised pest control system which will help the modern horticulturist rid his patch of all creepy crawlies.

The \$129 program features information and colour pictures of the most vicious breeds of

the little devils. Users can select the problem which is corrupting their greenery, and *Bugs* will work out which blighters are responsible. It will then present tactics designed to eliminate the nastiest of miniature hooligans.

Bugs will run on any PC running a 286 processor or higher. If you're being bugged by Californian insects then call 0101 213 372 5810. ■

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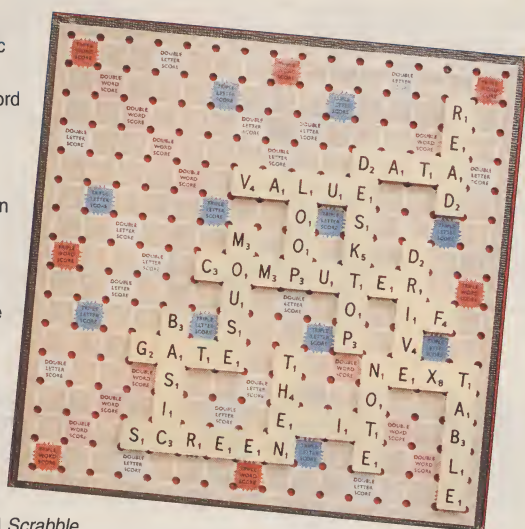
SCRAP OVER SCRABBLE

Board game giant Spear's has clamped down on a small Public Domain library for distributing a program similar to its world famous word puzzle *Scrabble*.

Enfield based Spear's Games warned The South West Software Library that legal action would be taken if it did not cease distribution of ST word game *STrabble*. Martyn Dryden, who runs the library said: "We could not contest the action. As a spare time business run by enthusiasts we can't possibly afford expensive lawyers."

Dryden maintains that distribution of Public Domain software is a non-profit making exercise and therefore not a threat to the likes of Spear's. He admitted that *STrabble* could harm sales of the official computerised *Scrabble* game (published by Virgin) but added: "It's up to the individual to choose".

Spear's legal spokesman Jeremy Spears told *Express*: "I can't really comment on this case because it's not fully resolved. But in general



terms, the *Scrabble* trademark is worth millions of pounds. It helps to pay our wages and therefore we take the trouble to protect it. If people do infringe our rights then we tend to come down heavily."

Something special to clean up the streets

Hill Street Blues, the latest in cops 'n' robbers computer games, has been launched with the more sophisticated crime fighter in mind.

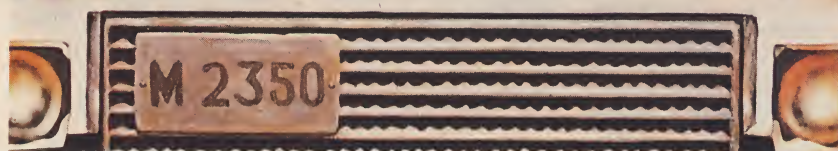
Based on the popular TV show, the game sets itself up as a crime fighting simulation. The player looks down on a small metropolis

(a la *Sim City*) where 10 per cent of the population are criminals.

You must deal with muggers, pickpockets, armed robbers and serial killers. But with a whole platoon of willing cops at your disposal the odds are not completely desperate.

Tony Cavanagh of publisher Krisalis, said: "This is a sophisticated game aimed at the kind of people who enjoyed the television programme so much."

It's out now on the Amiga for £24.99 with ST and PC versions to follow. ■



Psion posts new hand-held

Psion, made famous during the yuppie boom of the mid-1980s with its Organiser I and II handheld computers, has launched a new range of pocket micros.

The HC100 range is aimed at what Psion sees as the 60 per cent of the work force not yet computerised. This means travelling salespeople and warehouse managers will have access to what the company claims is "possibly the most advanced and versatile hand-held family in the world".

The new machines are based on Psion's SIBO architecture, first implemented in the MC (mobile computer) series of machines.

Priced at £395, the base unit comes with a choice of two key-boards - a 53 alphanumeric version, and a 32 key numeric and function key. No QWERTY version is planned.

The range comes with a 'fast serial' port which doubles as a charger for the Nicam batteries used to power it. Also included is a new version of Psion's OPL development language, called OPL/g. The g in this case stands for graphics.

Another feature which sets the system aside from the other hand-helds in the market is the use of Solid State Disks rather than floppies. These SSDs are able to hold up to 2Mb of data. ■



For all the details of the new launches and full analysis turn to page eight.



• *Thunder Jaws* – be a hero under water.

Coin-ops are coming

Domark continues its fruitful relationship with coin-op conversion specialists Tengen with the release of four more action-packed games over the coming months.

Out this week is *Skull and Crossbones*, a hack-'n-slash pirate adventure for two players set on the high seas. Besides battling against evil pirates and looking for treasure, you also have to face the Arch Magus and try to avoid the dreaded Medusa.

Due on April 17 is *Hydra*, in which you play a member of a futuristic courier agency. There are nine packages which have to get to their destinations so you had better learn how to steer your Hydracraft quickly before your enemies get hold of your cargo.

May 22 sees the release of the baseball sim *RBI2*. It features all 26 American Pro teams, each comprising 24 real players. The game combines elements of team management as well as ballpark action.

Finally, underwater action hits the screens in June with *Thunder Jaws*. You have to face cybernetic sharks, seaquakes and volcanic eruptions in an attempt to rescue the heroin from being turned into a lizard.

All the games will cost £24.99 for the ST and Amiga while the Spectrum and Amstrad versions will cost £9.99 on cassette and £14.99 on disk. PC dual version will also be available for £29.99. ■

14,000 cut from IBM payroll

IBM has announced plans to cut its world-wide work force by 14,000. Big Blue officials said that the company would achieve the reductions through a variety of actions, including voluntary incentive programs and attrition.

IBM officials added that the cuts are expected to yield before-tax savings of approximately \$200 million in 1991, \$600 million in 1992 and \$800

million annually in future years.

The company also said it plans to make a single accounting adjustment of \$2,300 million after taxes to recognise the company's accumulated pension obligations for employees.

IBM Chairman John Akers said: "IBM's restructuring actions are improving the company's competitiveness and we will continue to take steps to improve shareholder value." ■

Expand your Gameboy

Nintendo Gameboy owners are going peripherals mad as sales of add-ons for the hand-held games machine go through the roof.

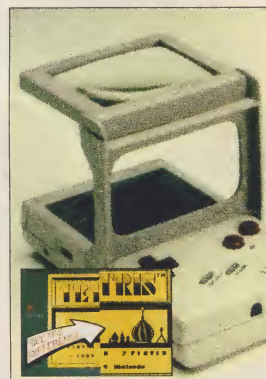
Articles such as the Gameboy light, magnifying glass, sound amplifier and carrying case are becoming essential purchases for discerning hand-held gamers.

Official UK distributor Curtis reckons £800,000 has been spent on add-on kit since the

range was launched three months ago. Some shops say they are selling seven lights for every ten Gameboys sold.

The Gameboy light and hard carry case both retail at £9.99, while the soft pack costs £6.99. A magnifier will set you back £6.99 while the sound amplifier costs £12.99. For more details, see your dealer. ■

• *Gameboy magnifier: take a closer look*



UK firm anticipates IBM's new standard

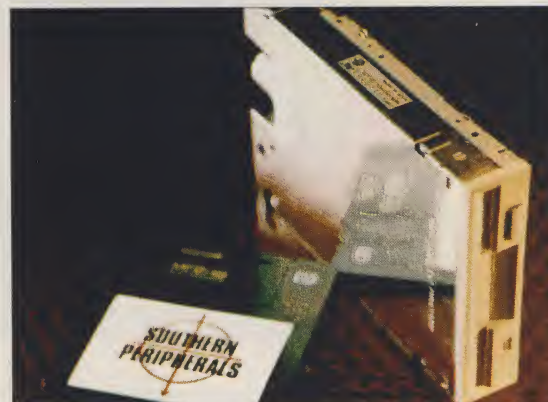
MEGA FLOPPY — UK RELEASE

A 4Mb compact 3.5-inch floppy disk drive has been launched in the UK by Southern Peripherals. The release is in anticipation of IBM's intention to move up to the 4Mb standard by the end of this year.

Called the Mitsumi C352T2, the one inch high drive is fully compatible with 1Mb and 2Mb media, and can be fitted by upgrading your PC's floppy controller.

Although 4Mb software is not yet available it should become common next year as software publishers and manufacturers take advantage of the extra space it offers.

Empty floppies are already in the shops although, at present, they are relatively expensive. Southern says its drive will cost



• *Mitsumi 4Mb drive: ahead of IBM.*

about £100.

The 160 track design has a 135tpi track density and with a disk speed of 3000rpm provid-

ing a data transfer rate of 1000kbps. Average access time is 94ms. For more information call 0256 819221. ■

Sage helps VAT victims

Quick off the mark, Sage Software is set to help thousands of business PC owners to make adjustments to their spreadsheets following the recent VAT rate changes.

The Newcastle company is sending out a fact sheet to all users of Sage accounting software which gives information on how to change software. All the company's programs provide a facility to change VAT rates, and many users are looking for simple guidelines.

Some 700,000 users have already been mailed, but if you have slipped off the user list, you can receive a free factsheet by calling 091 213 1555. ■

Scanner has the greytouch

Logitech is launching a new low cost, high performance hand-held scanner for the PC.

The ScanMan Model 32 which replaces the ScanMan Plus will be available in early May, and costs £20 less at £129. It comes bundled with a specially developed software package called GrayTouch, which the company claims provides 32 true grey levels for professional grey scale images, though by using software manipulation you can achieve up to 256 grey levels.

The software also offers extensive editing tools, a stitching command for full page images and a diskew function to straighten out pictures. Extended memory support means that users can scan images that exceed their own system's RAM capacity. Scanned images can be saved in IMG, TIFF and PCX formats.

The ScanMan 32 requires at least DOS 3.2 to run with 1Mb of RAM recommended.

Simon Barnard, head of Logi UK, the company's British subsidiary, reckons, "There is not another hand-held scanner in this price bracket that can stand comparison with ScanMan 32." ■

• *The ScanMan 32 is a high performance entry level hand-held scanner.*



Acorn's mega chip offers speeds ten times faster

SUPER A3000 IS ON THE WAY

Acorn is set to launch an enhanced version of its Archimedes A3000 later this year featuring a hard disk and the impressive ARM 3 chip.

Sources close to the company estimate that the price of the super A3000 could be as low as £1,000 – the basic A3000 currently retails at £750.

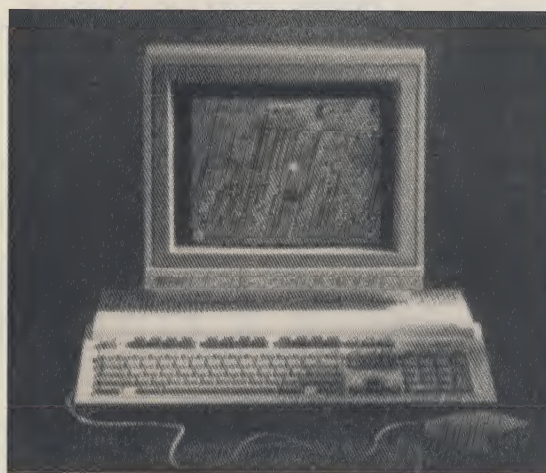
As first predicted in *Express* (Issue 53) the new machine will run Acorn's ARM 3 processor which can handle speeds up to ten times faster than the current A3000. Acorn's corporate com-

munications manager Brian Salter confirmed that announcements of new machines are to be made before the end of this year, but refused to go into details.

The new machine is not being pitched as a replacement for the BBC A3000, but as a faster option for schools, business and home owners. Salter commented: "The A3000 is enormously successful and there is no way we would kill off something that is doing so well. But every company has to work on research and development, and Acorn is no exception."

In addition to the processing power of the ARM 3 chip, Acorn will also offer buyers a 40Mb hard disk. The firm feels that the Archimedes has established itself as an alternative to MS-DOS technology and the Atari ST and Amiga. Now it wants to compete on price, an area in which Acorn has often been criticised.

Buyers hunting for an easy to use but extremely fast machine will not be disappointed. The ARM 3 zips along at 15 Million



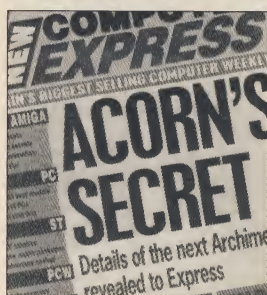
• A3000: bigger and better version by the end of this year.

Instructions Per Second, in comparison an Amiga can only handle about 1MIP.

Along with the new machine, Acorn is expected to launch an Archimedes compatible laptop aimed firmly at the top-end of the market. Salter confirmed that such a machine is scheduled to

make an appearance.

Meanwhile, Acorn has denied that the top-end A400 and 500 Archimedes are to be discontinued. A spokesman told the Micronet news service that the machines would be retained despite what some see as an old fashioned design. ■



• Express reveals Acorn's secret.

Smart weapons research

Computers have taken another step towards emulating the human brain with the launch of an American-designed system which can recognise three dimensional objects from any angle or perspective within seconds.

Sandia National Laboratories in Albuquerque has produced a neural network system comprising a video camera, an image digitiser, processing hardware and video screen displays which can pinpoint model tanks on a vast mock-up landscape. Neural networks are processing systems which resemble the nerve cells in the brain, and unlike conventional computers, the Sandia system can learn to recognise objects through trial and error without special programming.

Previously computers could only cope with objects being moved through two dimensions, ie, from side to side. But the Sandia system can cope with the targets being placed anywhere

within its field of vision and takes less than four seconds to do so.

The Sandia system is taught using multiple training sessions. At first it is fed information about the tanks as well as various other objects, and then it is tested on its ability to pick out the tanks. If it gives a wrong answer the researchers supply it with the correct information. By comparing the right and wrong answers the network 'learns' how to judge correctly; this process is called propagation.

"It forces a network to learn very specifically what is and what is not a tank," explains co-systems developer Mary Moya.

At the moment the system is being developed specifically for military use, but it could be applied to other fields. Robots in manufacturing processes could be trained to pick out components from an assembly line, or security systems could be taught to recognise badges or identifying marks on vehicles. ■



• Scoop for Mindscape: the original Paperboy.

Paperboy set to ride again

Paperboy 2, the sequel to one of the biggest selling games of the '80s, is set to become a Christmas smash this year.

Mindscape has acquired the rights from Atari's coin-op wing Tengen and is currently readying the follow-up for a September or October launch on all major formats.

The original game, which was released in 1987 by Elite, has sold over 500,000 units and Mindscape is bullishly predicting even greater sales for the new title.

Mindscape scooped the rights to *Paperboy 2* from Domark, the company which usually wins the licences for Tengen products in the UK. Mindscape already has the Nintendo rights for the original zany paper delivery game. ■

Oriental Macintosh



Mac users will be able to translate their text into Chinese Mandarin characters with a new package from BTG.

Sindex is an add-on package for the Mac Plus or above with at least 1Mb of RAM. An extension of the Apple's *Chinesetalk* package, *Sindex* lets you enter Mandarin characters and store them in an ASCII word processor, spreadsheet or database.

The software builds up special dictionaries and creates abbreviation files to facilitate even quicker entry or ultimately automatic translation. It also includes a pronunciation facility to help learn how to speak the language as well.

Sindex retails for £95. For further information contact BTG on 071-403 7586. ■

Huge Hard Disk

PC owners are being offered hard disk upgrades in 14 different Megabyte size options from 32Mb to a huge 1050Mb.

Plus Five peripherals reckons it can supply a hard disk for any PC. Prices start at £351 for the 32Mb drive, the Gigabyte hard disk costs £6,000. ■

US scares on health

● Fears that sustained use of computers can cause damage to arm muscles has prompted an American company to launch the Computer Wrist Relaxer.

The foam padded platform acts as a support for a user's wrists and arms, keeping hands straight and elbows level. Manufacturer, California-based Techmarket, claims that the Relaxer conforms with the advice of health professionals.

Techmarket says it could prevent users from developing Repetitive Strain Injury. Prices start at \$10.

● Researchers in the US claim that working with a computer can make you fat.

The Californian team of fitness watchers reckon that people who use typewriters are less likely to put-on weight than those who spend their days locked into a personal computer. Apparently, wrestling with a mechanical word processor uses more energy than entering data into a PC. ■

THE WEEK
IN VIEW

Following his confrontation with copyright lawyers, Martyn Dryden of The South West Software Library ponders the future of Public Domain . .

Public Domain software may be free (or nearly so), but that doesn't mean it's free of copyright. Whether it's a utility to convert ThisWrite(TM) documents to ThatWord(TM) format, The Mary Poppins demo, or Wiggle (a version of the well known board game Waggle), or if it involves someone else's intellectual property, then it may infringe their rights.

Copyright owners' attitudes vary. They may just ignore it. To a zillion-pound company, a PD library's activities are below the noise level. Or they could take it as a compliment. People admire their property, and no-one's making a profit out of it, so where's the harm?

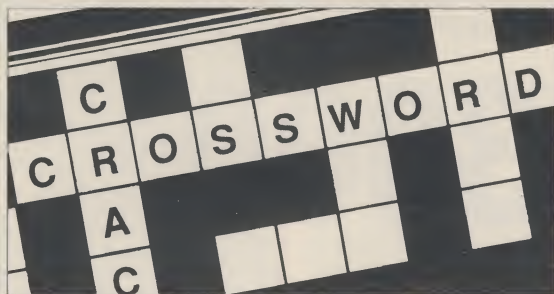
But then there's the 'lawyer-driven' attitude: the PD item is a counterfeit, which will mislead people into thinking it's a licensed or endorsed product, and damage the owner's reputation and goodwill.

The idea of almost free software, created and distributed by enthusiasts just for enjoyment, is totally foreign to the 'suits' involved in copyright law. As my learned friends might say, the fact (if it is a fact) is not to the point. And the only way you can argue is to hire a suit of your own, impossible for a back-bedroom PD library - their hourly rate is a week's wages.

My advice is to pay up and look cheerful. At least this will minimise your legal costs.

Perhaps 40 percent of PD software is infringing somebody somewhere's copyright. If this gets stomped by the suits, then the PD scene will suffer. Users won't be able to get hold of software easily, programmers won't see their work distributed widely, and computers won't be as useful, or as much fun.

But the suits won't mind, because nobody was making any money from it. ■



• Turning puzzles inside out

Cracking crosswords

A CD-ROM program has been launched for all crossword fanatics who are searching for a way to crack brain-busting puzzles.

Crossword Cracker from Nimbus Information Systems holds a database of 170,000 words - which the publisher

claims covers just about every word that crossword compilers can use. By typing in the number of letters contained in the clue and any letters you already have, Cracker automatically lists all the possible answers. The £40 program also includes an anagram solver. Call 0600 890602. ■

Sounding out the system

An amplified three way stereo speaker system which plugs straight into your home computer has been launched by Evesham Micros.

The Zydec twin speakers with built-in amplifiers come with bass, middle and treble speakers, volume control and power supply and are compatible with the Amiga, STE and Archimedes.

Evesham's Shaun Morris said: "Unless you're using your machine with a top quality Sony television you're not realising the sound potential of your hardware. The speakers in most monitors are very basic. With this system you get full range sound."

Zy-Fi costs £39.99. Call Evesham on 0386 765500. ■

• Zy-Fi: jacks up the volume



National database set for mid 1992

COP COMPUTER
TRACKS DOWN
MISSING PEOPLE

The Home Office is setting up a vast national database to help the police track down missing people deemed to be "at risk".

The database of vulnerable missing people is due to go on-line in 1992 as part of the new Police National Computer. Forces around the country will be able to access the database on PCs in their stations and download information on missing people, including their names, addresses and descriptions.

The police force is obliged to

keep a list of missing people under a 1979 recommendation of the Council of Europe. People categorised as "at risk" include children under 18, the over 65s, anyone suspected of injury and the mentally or physically ill.

At the moment each police force makes its own individual list, but the missing people database will be first such national listing in the UK.

A Home Office official told Express: "We are anxious to move towards a central register which will be of great benefit to

the police force and we are hopeful that it can be put into effect by mid next year."

The Home Office is unable to give details of the system at the moment. A spokesman explained: "We have not yet got a development program. But over the next 15 months details will become a lot clearer."

The new Police National Computer, which was announced in 1989, is due to be operational by mid 1992 and is based on a H120 dual processor Siemens mainframe. ■

Millions all
in the mind

One of the first steps to becoming a millionaire is never to go shopping on an empty stomach, according to software just released from software house Psych-cess.

How to live like a millionaire on an ordinary budget is an American program for the PC which analyses your spending habits and suggests ways you can make your money go further without making major cutbacks.

According to Psych-cess principal Ian Stringer, himself a psychologist, the guidance given in the program is "good sound advice based on simple ideas".

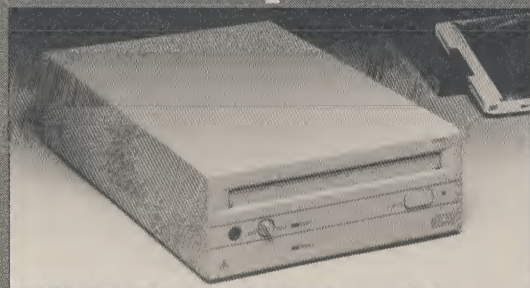
According to Stringer, if you go food shopping when you are hungry you are bound to be tempted to buy more food.

The program also advises on the dynamics of becoming wealthy and the steps necessary to become fabulously rich.

"The message is 'Am I thinking about money the right way? Once you start thinking about it seriously then you can make the change,'" reckons Stringer.

How to live like a millionaire costs £50 from Psych-cess on 021 323 2282. ■

Atari spins CD surprise



• Atari's updated CD-ROM: better luck this time round?

Atari has unveiled a reconfigured version of its three-year-old CD-ROM drive. The £399 device can be connected to any ST or TT, and boasts a storage capacity of 500Mb. It comes with Cobra retrieval software for efficient management of data.

Called simply Atari CD-ROM, it can be used as a normal audio CD player and it conforms to the Hi-Sierra format and, according to an Atari spokesman, will run "loads" of CD-ROM disks.

Atari was one of the first companies to launch a CD-ROM drive when it produced the original ST compatible drive in 1988. However, that failed to make much of an impression - by the time there was enough software available to make it a worthwhile purchase, other companies had launched better machines. Now Atari hopes its reconfigured product will prove more attractive to buyers. ■

Phone listings firm disappears

DIAL M FOR MOVED ...

British Telecom has taken out a High Court injunction against a company which advertised computer software for telephone directory listings before disappearing with thousands of pounds of clients money.

The company, Compact Information Systems, advertised to businesses seeking to avoid charges recently introduced by British Telecom for Directory Enquiry services. It claimed to have developed a software program containing all the business and domestic telephone subscribers in the UK.

Advertisements had been placed in several computer magazines offering the software package for £99. The firm oper-

ated from premises in Cardiff, employing agency staff to handle incoming calls from customers.

Cardiff police investigated the company after receiving complaints from people who had lost their money. A spokesman offered: "We have had dozens of phone calls from irate customers concerning the activities of this company. The sums involved run to thousands of pounds. We are still conducting enquiries into the disappearance."

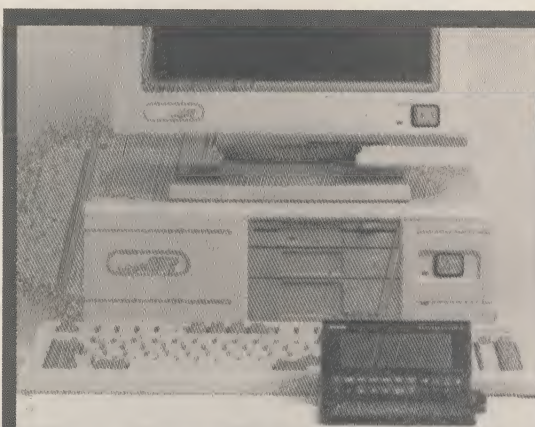
"The company directors evidently let their fingers do the walking because they registered the company with names and addresses obtained from the telephone directory."

Other telephone software suppliers are indignant at the

activities of the Cardiff company. Sector Software in Leyland has recently won a licence by BT to supply a program which gives users any dialling code in the UK.

Managing director David Batty said: "Only a small number of firms have been granted licences by British Telecom. Any customers wanting to check the pedigree of a telephone software product should contact British Telecom."

A spokesman for Telecom said: "We have been granted a High Court injunction against Compact restraining the company from publishing and selling British Telecom information. If the company fails to comply criminal proceedings will be instituted."



• Information from the diaries can be downloaded to PCs through the Datalink 200.

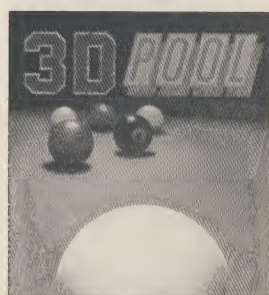
Casio picks PCs

Casio has launched a range of powerful electronic organisers along with an interface to make the top line models PC compatible.

There are three models in the Casio Digital Diaries range, the SF 4000, the SF 7500 and the SF 9500 retailing at £69.99, £119.99 and £194.99 respectively. Information for all models is input on a QWERTY stroke keyboard and each has a six line LCD display. The top model can store up to 3,000 telephone numbers, features a schedule keeper with an alarm, a 200 year calendar, a calculator and a digital clock which can display the local time in over 220 cities.

Via the specially designed Datalink 200 interface the SF 7500 and SF 9500 can be linked to IBM PCs for transferring information. Casio suggests that companies could build up a network of the diaries for its key staff, with information being downloaded to central PC. Datalink 200 retails for £94.99.

Casio can be contacted on 081-450 9131. ■



• 3D Pool: well worth a tanner.

Cut price classics

Two classic 3-D titles are being re-released at the budget price of £9.99 on the Mirror Image label.

Carrier Command, first released three years ago, was one of the first programs to effectively use 3-D filled vector graphics to enhance the action.

The game itself is a blend of arcade action and strategy with the player at the helm of a massive aircraft carrier. It also features a 'peace virus' which you can drop on your enemies to change their points of view.

3-D Pool offers a unique 3-D perspective of the table from any angle so that you can carefully set up your shot. Both games are out this month for the Atari ST, Amiga and PC. ■

Pascak opens windows

Popular power programming language Turbo Pascal is available for Windows. Publisher Borland claims that this latest version of Turbo Pascal will allow millions of programmers to develop programs that will run under Microsoft Windows.

Turbo Pascal for Windows makes programming for that environment simpler by using an interface that reduces the amount of code needed for Windows applications.

The Application Program

Interface means that the part of the program needed to marry the code to the Windows environment already exists in a bolt on form that the programmer can simply integrate.

Turbo Pascal for Windows stands alone and doesn't need the normal Microsoft Development Kit to produce Windows applications. The £149.95 kit is available from software suppliers and an upgrade version is available to existing registered owners for £69.95. ■



• Turbo Pascal for Windows: simpler all round

Freebies for DTP trade ins

GST is offering a free presentation graphics program worth £130 when you trade in your old desktop publishing system for its low cost DESKpress DTP package for the PC.

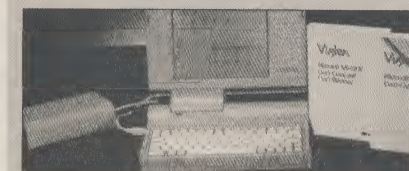
From May 1 existing DTP users will be able to claim a free copy of Davrelle, which lets you create professional 3-D presentations on a PC, when they buy the £279 DESKpress package. They will just have to send a systems disk from their existing DTP software along with the DESKpress registration card and application form to GST to receive Davrelle.

The company claims that the offer applies to users of absolutely any Desktop Publishing system, from its own Timeworks Publisher to Fleet Street Editor.

DESKpress is a low cost system which provides many of the features of professional DTP packages.

For further details contact Maria Porto at GST Software Products, Meadow Lane, St Ives, Cambs PE17 4LG, or telephone 0480 496789. ■

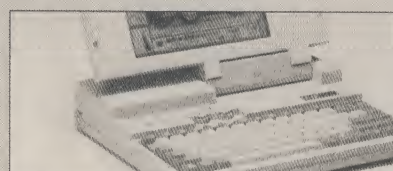
Double launch of powerful portables



• Viglen 32-bit: cheap.

Two high spec, low price 386 notebook PCs have been launched separately by Viglen and NESS.

The Viglen machine is a 32-bit 386SX called the Dossier, retailing at £1,699. With 20MHz the notebook offers 2Mb of RAM, a 20Mb hard disk and a 1.44Mb floppy drive as standard. It has a VGA liquid crystal screen, an 81 key keyboard and comes with MS-DOS and Windows 3.0. Weighing less than 3kg, it has a footprint of about 12x7 inches and comes with a



• NESS 286: cheaper still.

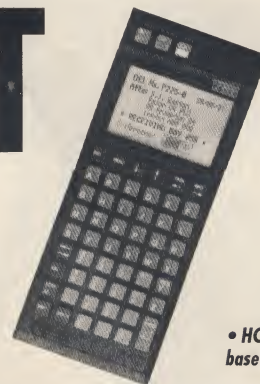
carrying case. The company claims that fully charged, the notebook should work for up to three hours.

The NESS 386SX has a footprint of just less than a foot square and runs at either 16 or 20MHz. It has an 83 key keyboard and a 640x480 pixel backlit display which is VGA compatible. MS-DOS 4.01 and GW Basic are standard and the package retails for £1,399.

Viglen can be contacted on 081-997 3000 and NESS is on 081 452 8233. ■

Voice rather than handwriting recognition is the way of the future

PSION'S NEWEST



• HC100
base unit



Potter: "possibly the most powerful handheld family in the world".

Psion, best known in the UK for its 'personal organisers', has launched its next family of hand-held machines. Tim Smith inspects a gadget...

First off the blocks came the MC (mobile computer) range which boasted MS-DOS compatibility, but it was pitched at an area above the handheld and below the notebook. The new HC range of machines are quite definitely handhelds. Psion makes large claims for the future of this area of computing, quoting recent Dataquest research which maintains that from now until 1994, it will see a 90 per cent growth compared to a meagre 14 per cent for laptops.

To look at, the HC bears a much closer resemblance to its Organiser II ancestors than to the MC computers which make use of the same SIBO architecture. The keypad, which comes in a choice of either 53 key alphanumeric or 31 key numeric and function, actually sports near finger-sized keys. While this might gladden the hearts of any on-road writers, they will soon be brought down to earth by the fact that there is no QWERTY keyboard planned.

The reason for this, according to chair-

man and managing director, Dr David Potter, is that none of the major competition, mostly to be found in the States, bother with QWERTY. The HC is aimed squarely at the corporate market. Specifically, and again American influenced, it is the Public Direct Network (PDN) users which "is the sector we're attracting with the HC range," says Potter. With a price point of £395 for a single unit, which comes without an RS323 interface and makes use of Solid State Disks (SSDs) rather than floppies, this is no surprise.

Although this implementation of the architecture is impressive; there are, according to Potter, developments occurring already by "the likes of ICL and IBM" which seek to extend the machine. To this end, Psion had made certain that the HC operates under an MS-DOS standard operating system. This is said to be fully multi-tasking as well as offering a windowing front end. A Macintosh link is also being developed although this is not expected to see the light of day until at least next month.

GET ORGANISED

With competitors such as Agenda, and Sharp eating into what was considered to be Psion's domain, does this switch away from the individual consumer to the corporate market signal the death of the Organiser?

Not according to marketing manager John Morrow: "Only an idiot could miss the potential of the SIBO architecture. I personally would like to see it extended into the consumer market. Although there

is competition in the organiser market (which we invented) from the likes of Sharp, to a lesser extent Casio, and Atari with its hybrid machine, the Organiser is not dead."

Morrow also predicts that an Organiser III could be in the offing. "We are concentrating on this new launch for the moment," he said.

Potter is equally pleased to concentrate on the new Psion range, claiming that it is "possibly the most powerful hand-held family in the world at the moment". When quizzed on the likelihood of Psion abandoning the Organiser range in order to expand its 65 per cent interest in the corporate arena, Potter was adamant that "the HC is not a replacement for the Organiser".

SPEAKING IN TONGUES

The most interesting aspect for the home user was the question of how SIBO architecture will expand in the future. With the likes of the Grid Pad and ST-Pad, as well as Epson's Portable System Machine, making use of touch-screen technology, a keyboardless system is being seriously considered by Psion.

On the possibility of a future Psion-Pad, Potter revealed: "We have built the ability for touch-pad usage into the architecture of the HC range. Intrinsic to the keyboard layout is that you can have a digitiser, which is a pointing device for data input."

"That's built-in, so we can do that now. The wider impact of the question is the recent talk of palm-top machines and character recognition. We are not looking at character recognition as a form of data entry at this stage, although in principle it can be implemented because the hardware technology is there. We don't believe that that is the key route to pursue. We do believe is very important, and parallel to this, is voice recognition."

"Voice recognition is now getting to the state where this machine can, with the correct interface, recognise a vocabulary of 120 to 160 words. This is ideal for data entry in many environments. The machine has voice and sound capabilities built-in to it intrinsically to allow us to pursue this during 1992 and beyond".

If Psion is serious about extending the SIBO architecture into this field, and if the stated claim that the Organiser is not to be replaced, then it might be possible within the next few years to see a new breed of yuppies sending voice faxes from their palm tops computers. ■

SIBO

The SIBO architecture on which both the MC and HC range of computers are based is seen by Psion as the hand-held version of a 386 PC. The name itself stands for nothing, it is merely a code word.

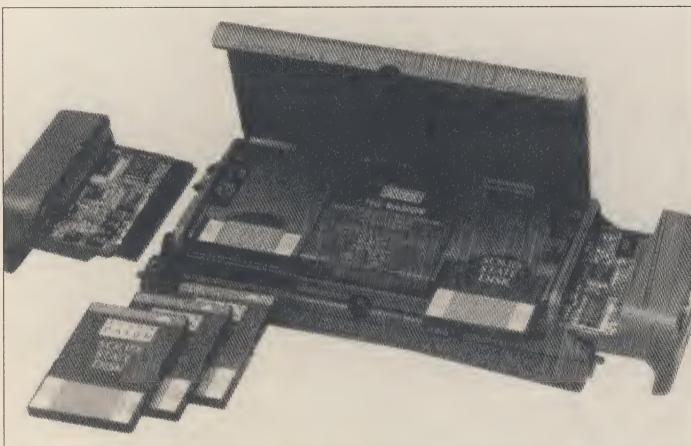
According to Psion, SIBO is platform architecture based on the 16-bit 80C36 static C-MOS processor. This provides multi-tasking and a full windowing interface for the user. SIBO also makes use of a type of ROM generic to Psion, and called Flash. Although it acts in the same way as Erasable Programmable Memory (EPROM) the major difference is that Flash can be electronically erased; EPROM has to be erased using UV rays.

Essentially, SIBO is a platform for 'open system' management. This means that customising the operating system and functions can be carried out with ease by developers; an example of this is the forthcoming OS/2 emulator planned for the system. SIBO also allows for the use of Solid State Disks (SSDs) rather than conventional floppy or hard disks.

TECH SPECS

According to Dr David Potter, the new Psion HC computer is "not a product launch, it is aimed at open systems and solutions". Aside from those already mentioned, the basic HC specifications are as follows.

- 16-bit 80C86 processor.
- LCD 160 x 80 dot screen with switchable backlighting.
- 128 to 512K RAM
- Two internal Solid State Disk (SSD) drives. 2Mb of storage per SSD.
- Two internal expansion slots.
- High Speed serial port.
- Rechargeable Nicam batteries.
- Standard 'C' and OPL/g programming and development languages. Programs written on the HC using the C language can be ported IBM PC and compatibles for tidying up.
- A 'Cradle' unit. The HC is connected to this unit via its High Speed serial port. The Cradle serves three main purposes: it acts as a battery charger; it can be used to download information gathered by the HC to office bound PCs and Macs; it can be used to upload data from the office desktop machine for later use.
- For more information telephone Psion on 071-262 5580.



• The HC100 is a totally modular unit. Even the keyboard is removeable and has the capability to be used as a touch-pad system.

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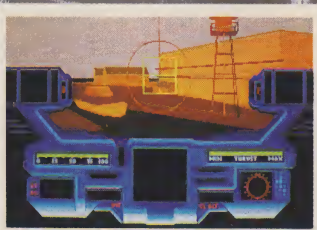
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Versatile, powerful and reliable, the Goldstar GS 347 from Silica Systems is the type of PC clone that gives PC clones a good name. Bridging the gap between number crunching high end business PCs and the more basic machines you see keeping the accounts in order at the local shop, the GS 347 is a realistic alternative to brand name PCs for those who need a more refined machine at an affordable price.

For a PC clone the GS 347 is surprisingly stylish in design, and is indicative of the general quality of the machine. The GS 347 is based on a 25MHz 386DX microprocessor, with 1Mb of RAM. The top model in the range offers a 40Mb hard disk and both 5.25 and 3.5-inch floppy disk drives and supports colour VGA graphics. In terms of performance it matches many of the brand names and could easily fit into information technology-intensive environments.

However, its real strength lies with the fact that it is so dependable and adaptable. It is not the cheapest of PC clones, retailing at just under £1,900 for the 40Mb model (though you will have to pay an extra £200 for a monitor) but the little bit extra you pay is rewarded.

UNCOMPLAINING EXPANDABILITY

We have been using the Goldstar in the *Express* office for a couple of months as the standard PC workhorse, so, as you might expect on a computer magazine, it has been ruthlessly run through a whole gamut of applications and driven a vast variety of peripherals. CD ROM drives, laser printers, scanners, OCR scanner (Optical Character Recognition) and more have all been connected up to it with no compatibility problems and it has coped with all the software we have thrown at it with no fuss at all. From Windows applications and large spreadsheets to shoot-'em-up games and graphics programs, it has taken everything in its stride. A very impressive 35 nanoseconds access time also helps to make life that little bit more pleasurable.

The GS 347 has five industry standard expansion slots and so far we have encountered no problems installing drivers cards or adding memory. This is especially impressive considering that we had many of the peripherals mentioned above connected simultaneously. Removing and replacing the casing is as simple as twisting a few screws and the interior is roomy enough not to have to worry about losing screws in the works or scraping your knuckles when slotting in cards.

The only foreseeable problem arises from the fact that the slots are arranged horizontally which restricts ventilation. As hot air rises this means that when cards at the bottom are being used, the heat will convect upwards towards the other cards and then become trapped. The result is a build up of heat which could ultimately damage the cards.

Ports and sockets have been kept strictly to the necessary minimum, but they are very clearly labelled to make life easier when connecting things up. The system unit does not have a large footprint so should fit easily on most average sized desks. But if you are really short of room, then the unit does not seem to mind standing on its side, in which case you can tuck it safely out of the way under your desk. This also helps prevent the heat build up caused by the horizontal expansion slots. The step-sculptured full-sized keyboard has that familiar clunky but comfortable IBM feel.

You have to buy a monitor separately, but the one Goldstar recommends, its own 1430 14-inch VGA colour monitor at £269.08, is serviceable enough and stands on a fairly flexible pivot joint so that you can adjust it to the most comfortable position for you.

One feature of the GS 347 which is rare among PC clones is the lock off key. This provides extra security by locking off the computer so that it will not accept any input from the keyboard. It can be used in conjunction with the password feature for double security.



PC clones need not be cheap second class versions of the IBM archetypes. Dave Golder puts the GS 347 through the class test.

FIRST CLASS CLONING

BAD GRAMMAR

The manual is concise and easy to understand with clearly annotated diagrams. But it is marred by some appalling grammar. For example:

"Things what you can see on the motherboard are composed of connectors, sockets etc."

While this might seem a minor criticism, remember that most people will flick through a manual when considering which PC to buy. If they see grammar as bad as the example above, they are going to get a very bad general impression of the company concerned; if the company is that slapdash in one department, then you have to question its competence in other areas. This is a shame, because, as the GS 347 proves, you should not judge a computer by its manual. Other clone manufacturers take note!

Perhaps the best recommendation for the GS 347

is the general consensus in the *Express* office is that it is one of the most satisfyingly trouble free PCs we have ever had. This is one clone which is very difficult to distinguish from the real thing, and that is no bad thing.

GS 347 QUICK REFERENCE

Based on a 25MHz 386DX microprocessor with 1Mb of RAM as standard the GS 347/25 with a 40Mb hard disk and both 3.5 and 5.25-inch industry standard floppy drives. MS DOS 4.0 and GW-BASIC 3.2 are bundled with the package. It retails at £1878.83 including VAT.

The Goldstar 1430 14-inch VGA colour monitor retails at £269.08.■

Silica Systems can be contacted at 1-4, The Mews, Heatherley Road, Sidcup, Kent DA14 4DX or telephone 081-309 1111.

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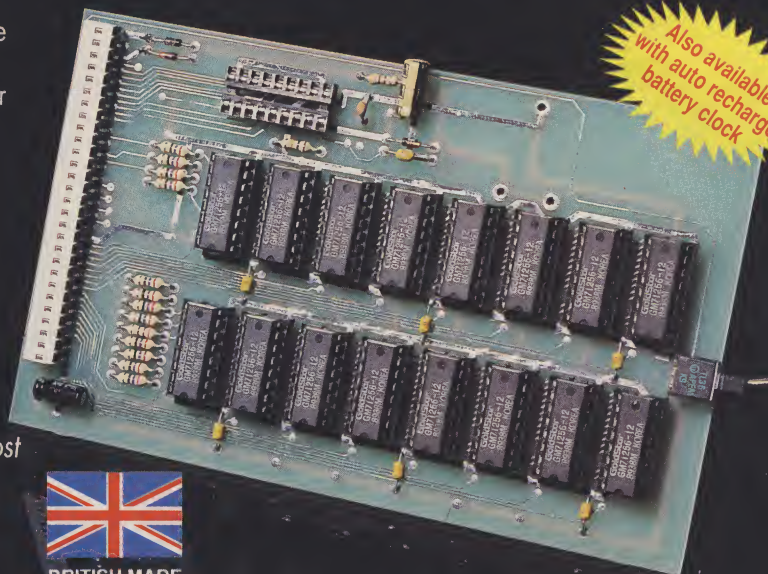
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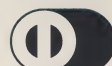
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Amiga update

Jay Lee's comment about the Amiga and 70Hz displays (*Express* 125) was true in the past, but no longer! Regular subscribers to comp.sys.Amiga on Usenet will probably recall an article posted some months back (by Dave Haynie, Commodore Amiga hardware guru and all-round good guy, as I recall) which mentioned that using the Amiga Enhanced Chip Set and the CBM Display Enhancer ('flicker fixer') it was possible to produce a non-interlaced 70Hz display with screen dimensions of about 720x380.

I can't find the posting in my listings, so you'll just have to take my word for it. But based on this, it should also be possible to alter the ECS Productivity mode (max 680x495 non-interlaced) to generate a 70Hz display albeit with some loss of vertical or horizontal resolution, even on machines not fitted with display enhancers.

Warning: if you have an Amiga fitted with the Super Agnus and Super Denise don't try poking previously unused custom chip registers to try to generate the above - you could well wreak havoc with your monitor, possibly permanently.

No doubt other Amiga owners will pick up on Jay's remaining comments...

Mike Froggatt, Tunbridge Wells

Surprisingly enough, Mike, No! You are the only one to fire a salvo back across Jay's bows. But thanks for your detailed information.

H F-W



Pirate publishers?

Software houses complain about software piracy, but they do so as if they were so perfect and unstained that they don't deserve what they get.

I'm not a pirate - although I was in my

younger days, I no longer have any contact with any pirating groups. But I would like to point out a couple of facts which software houses tend not to mention too often. The two cases I am about to mention concern software houses that are often at the forefront of the 'hang the pirates' syndicate. I know both of these incidences are true, and that they are only the tip of the iceberg, but I am writing about them without the permission of the programmers concerned (both good friends of mine) so any repercussions are to be levelled at me.

The first case concerns a programmer who dedicated most of his teenage years to programming the Commodore 64. After learning how to program in machine code, he set about writing several routines that were the first of their kind. The C64 could handle 8 sprites on screen at once, but this person figured out how to display 32 sprites on screen, each one animated as well as the original 8.

OK, I know this is old hat now, but this is going back a few years and no-one had seen it done before. He decided to take the game he had written to a local software house, where they looked at it, examined it and returned it to him, saying that the sprite routines were 'OK' but the game needed several changes.

So he went home and spent the next few months beefing up the rest of the game. About two months after his original visit to the software house they brought out a game which just happened to have 32 sprites on screen and the new 'revolutionary' sprite routines were exactly the same as my friend had in his game. Being young and trusting at the time, he hadn't taken any copyright precautions and could do nothing about this.

The second example concerns a well-known graphics programmer who ended up being commissioned to do the graphics for a major C64 game which sold nearly half a million units in Europe and nearly as

many again in America! What did the programmer get for this game. You wouldn't believe it - a whole £1,000. Yes, a grand for what was one of the most popular games of its time.

Name and address supplied

Well there's a couple of nasty tales... The first instance does sound like seriously bad news for the programmer concerned - a cautionary tale, indeed, for anyone who comes up with something new in whatever walk of life: always take steps to protect your ideas. All you need to do is mail a copy of your work to yourself recorded delivery, placing the stamp on the back of the envelope so that it acts as a seal, covering the join between the flap of the envelope and the back of the envelope.

But the second example you give is not quite so wicked - presumably the programmer in question agreed to the fee of £1,000 up front and was happy with it at the time? Sure, a wiser negotiator might have done a royalty deal, and the company concerned might, out of the goodness of its heart, have bunged him some more dosh when the game became such a rip-roaring success, but would have been under no moral obligation to do so. It's a case of 'caveat vendor' when you sell your services.

I'm glad that you use neither instance as an excuse to tar the entire software industry with the same brush, and I'm glad that you use neither case as a charter for piracy. Have a fiver for being so sensible.

H F-W

Archie PD

In *Express* 123, Andrew Clarke wrote asking about Archimedes PD libraries. Here's a list of the ones I know of:

ACME PDSL, 17 May Avenue, Wollaton, Nottingham NG8 2NE (enclose

22p stamp); APDL, 96 Lanehouse Road, Thornaby, Cleveland TS17 8EA (send an SAE at least); Arcaynia, PO Box 1927, Sutton Coldfield B74 3QZ (enclose £1 for disk); ARXE Systems Ltd, PO Box 898, Forest Gate, London E7 9HJ (enclose SAE at least); DVS Public Domain, 10 Ravenhurst Drive, Birmingham B43 7RS (enclose SAE at least); Mr Bee PD, 3 Willoughby Lane, Widmerpool, Notts NG12 5PU (enclose £1 for catalogue); Skyfall PD, PO Box 2220, Birmingham B43 5RZ (enclose A5 SAE or £1 for disk); STWPD, 12 Mornington Road, Radlett, Herts WD7 7BL (send a SAE at least); The Datafile PD, 22 Duxford Drive, Aldergrove, Co Antrim, Northern Ireland BT26 (send £1 for disk).

Finally, another plug for *Eureka Software* would be appreciated - write to me C/o Mrs Doris Butcher, Freeman Hall, The Trinity School, Guys Cliffe Avenue, Leamington Spa, Warwickshire CV32 6NB.

Chris Eason, Leamington Spa

Well, thanks for all that information Chris - that plug for *Eureka* was a pleasure!

H F-W

Poor service

Some time ago I purchased the program *Kind Words II*, which I found very good - easy to understand and use, the manual was simple enough to follow and both the spelling checker and thesaurus were big enough for my needs.

When I bought it, I had an Amiga 500 and used a Star LC10 colour printer. Then I upgraded to a HP DeskJet, eagerly set up my new printer, started *Kind Words II* and to my dismay found that I could not print out the fonts supplied with the program. I double-checked my printer set-up and found that everything was as it should be, then re-read the manual. There was an item concerning the DeskJet and I quote: 'There are some problems with the DeskJet driver - please call our technical

support to see if a new super driver is available.'

I typed out a request and sent it with a blank disk and return postage to the address given. I waited three weeks without a reply then sent another letter. Still no reply.

What I find most annoying is that companies ask you to buy their wares and to register, which I did, then when you contact them for help you are ignored. OK, the super driver may not have been available, but it would have cost them nothing to advise me of this. This sort of treatment can only encourage people to turn to crime and accept cracked software.

My advice to companies is not to make promises and then fail to honour them - or you can't expect the public to have an respect or honour for you and your products. I'm now going to have to sell *Kind Words II*, which I don't want to do, but without the super driver I can't use the program for the purpose I bought it for. I'll just have to use another word processor that can make use of my printer.

Norman Stone, 64 Sandford Road, Chelmsford, Essex CM2 6DQ

Bad news, eh Norman? But I've taken the liberty of printing your full address in case any of our readers has solved the *Kind Words II* DeskJet problem and would like to get in touch with you.

H F-W

■ Price conscious

I refer to the current great interest in computer auctions. I regularly attend these and have done for almost three years now. It's true to say that there's a boom in interest in these events with more and more members of the general public attending.

But the vast majority of them must either have money to burn, or they do not buy any computer magazines. I say this, because at one particular auction house a regular entry has been brand new Amiga 500s with mouse, modulator, and operating system software - and nothing else. Bidders have been quite happy to pay £240 for these - but then you have to add

VAT and buyers' commission on to this, which bumps the price up to £290 at the old VAT rate of 15 per cent

Comparing this to the discounted price of Amiga 500s in the shops and the fact that you get no bundled software or warranty of any kind, I would hardly call that a bargain, would you? As for items being 'new' I would take that with a pinch of salt. Also, people pay fantastically inflated prices for such things as blank disks - prices that I should think a lot of disk suppliers would be over the moon about if they could get the money that people are prepared to pay out at auction.

I have no axe to grind, and am lucky in that I can repair most faulty items obtained from auction. I just wonder why it is that, in this so-called recession, people are happy to pay a price higher than they could get in the shops?

C Hatton, Dagenham

The trouble with auctions is that the novice can easily get carried away with the atmosphere and the excitement of bidding for a lot. If you have gone along to buy something, it can be very difficult to leave without actually doing so - and a lot of people are prepared to bid higher than common sense dictates.

Wise folks will scour the pages of *Shopping Express* and get a good grasp of the best prices available before going off to an auction, and will only spend money on bargains. Fools will easily be parted with their money - and that has always been a fact of life.

H F-W

■ Amstrad bashed

I read with interest your report on Amstrad's ST basher in *Express* 124, but I think your line of argument is out a bit. The PC4000 will flop for some good reasons:

First, the Amiga and ST have the 16-bit market wrapped up between them.

Second the price you quoted - around £700 - is just too much. Witness the Archimedes 3000 which has a wonderful spec but is just too expensive to compete on an equal basis with either the

Commodore or Atari machines in the home market. Are people really going to pay more for less? I don't think so.

Third, the Amstrad machine may be a 286 with VGA but (extra colours aside) I'm afraid the Amiga and even the ST are far better graphics engines. VGA is too slow for the kind of games people expect now.

Unless Amstrad does something clever like add a blitter chip or graphics co-processor, this machine will suffer the same fate as all other 286 machines - jerky sprites, terrible scrolling and poor sound. But it's hard to see how they can add to the basic PC without causing problems with existing software.

Tom Kirby-Green, London

Don't forget that there's an increasing amount of hot games software arriving on the PC first these days; and when the CPC range was launched, 'anyone with an ounce of sense' would have seen that Commodore and Sinclair has the market sewn up with the C64 and Spectrum, and just look what happened!

H F-W

■ Pirate hype?

I am quite sceptical at the news value of the *Psygnosis Lemmings* piece in *Express* 121. While *Psygnosis* is justifiably dismayed at the appearance of the game on pirate Bulletin Boards within two days of release, this, unfortunately, is the rule not the exception in pirate activity. I'm sure they know this. The press release presented it as an unusual event, and in effect, played down the extent of pirate activity.

Are software companies and magazines reluctant to publicise the actual extent of piracy - ie 99 per cent of software cracked and transmitted across the world within one or two days of release - in the same way that people are reluctant to have children taught about sex, drugs, AIDS and so on, for fear of encouraging them?

Mark Powell, Bristol

Interesting point - but one that falls down when you take a look at it. We have covered the subject of piracy in some considerable depth in *Express*. The problem is, it's impossible to audit the effect that piracy has on sales or to set an accurate figure on how many copies of a game are pirated.

Some software houses reckon that as many as 25 pirate copies exist for each legitimate copy sold, and they may well be right. Some companies are actively considering winding down their 16-bit development programs in favour of consoles. Cartridges will never be pirated with the ease and speed that disk games can be pirated - but the story in *Express* 126 about professional cartridge forgers reveals that consoles are the ideal solution to the problem.

One day, people may just stop going to all the bother of producing original software - if all they are doing is placing high-quality work in the public domain. And that would be a very sad day indeed.

H F-W

MAIL SHORTS

■ Scooby Doo query

Interesting to see that HiTec are due to release a Scooby game (*Express* 126) - but didn't Elite systems have one in the pipeline years ago?

Martin Faulk, Hainault

It certainly did, and a very ambitious project it was too - it would have ended up more like a Cinemaware game than anything else around at the time. It proved too ambitious though; a completely different version of the game was released and Gargoyles of Dudley did all the work.

H F-W

■ Religious relation?

Is Steve Carey, now the publisher of *ST Format* but the one-time outspoken critic of Atari and almost everything Amiga any relation to the new Archbishop of Canterbury? I think we should be told...

Alan Dunsmore, Pershore

Apparently not. But he could very easily have ended up as a Cardinal (like an Archbishop, but the other flavour). For the full story, you'll have to wait for the book *I was a Seminary Boy Until I Discovered the ST* which Steve is rumoured to be writing.

H F-W

■ Demo fan

I often purchase several magazines each month, and most of them have a disk on the cover. I think that the playable demos of games they contain are of tremendous benefit to software purchasers, more so than any static advertisement. The only problem lies in the fact that if pre-launch demos become commonplace, then software houses which didn't release product demos might lose out to those which did, because people might think that if a product didn't have a demo then it wouldn't be worth buying.

Duncan Richardson, Stoke-on-Trent

An artificial danger, methinks Duncan. I'm all for the 'try before you buy' opportunities that demos can offer - ever tried getting a go on a game in the shop before you buy it? At least when it comes to buying records, you can hear them on radio first.

H F-W

■ Wants to be first

Can I just be the first to say 'Happy Easter' to all my friends.

Mike Jensen, London

Idiot. Don't you realise that there is a time delay between writing in and getting your letter in print?

H F-W

■ Musical poser solved by Crash

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I recognise the two men in the pictures.

The one on the left is

Sean Masterson and the other one is Graeme Kidd.

Lee Theasby, Hartlepool

Only half right - but have a fiver H F-W

The one on the left is Garth 'Boy' Sumpter and the other is Graeme Kidd. The pics first appeared in *Crash* Christmas Special in 1985. I've sent you a copy of what was perhaps the most interesting pic of all...

Kenny Anderson, Dunfermline

Two fivers for you. Let's have some more amusing snaps folks... H F-W



• Kevin Cox desperately seeking a phone box.

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Macintosh

MAC ON-LINE

Virtually every week, the phrase "available from CIX and other bulletin boards" appears in this column when I'm talking about shareware and public domain software. So, this week I thought I'd list my top few Mac-friendly bulletin boards. Armed with these numbers (and a modem) you should have no problems loading yourself with good, cheap software.

• **CIX** – Less a bulletin board, more a conferencing system, CIX is highly popular among modem-owning Mac users. It consists of a vast number of 'conferences', each of which deals with a specific subject. All members are free to contribute to the discussion, and any queries posted are usually provided with helpful answers by other members within a day or two.

The most useful conferences for Mac users are 'mac' and 'macuser'. To join, say, the mac conference, just type 'join mac'. Within the mac conference there is a topic called 'files' which contains loads of files available for download. But don't just join the Mac conferences; whatever your interest there's bound to be a conference dedicated to it – if not, you can always start one yourself!

CIX has a minimum charge of about £7.25 per month; on-line costs are between £2 and £3 per hour, depending on whether you use the service at peak times or not. For more details, give the helpline a ring on 081-390 8446 or log on to the service (8 data bits, no parity, one stop bit) on 081-390 1244 and sign on with the user name 'new'; this will take you through the registration procedure.

• **Buz Board** – This is a bulletin board which caters for a variety of different machines, but mainly for the IBM-PC, Apple II and Mac. There is a large number of files available for download, ranging from games to development tools. The board's phone number is

081-200 9175, and again the protocols are 8,n,1. When you first log on you will be asked for your name, address and phone number. You should be 'validated' within a day or so, after which time you can use the full facilities of the board at no charge.

• **Mouse to Mouse**. This board has been 'off the air' for a few months, but is now back up and running. The new phone number is 0227 470706, and – again – protocols required are 8,n,1. The board is free to use, and is run by a guy who also has an Apple dealership – so he can offer you discounts on some Mac hardware. The board is dedicated to the Mac only, and is unusual in that it is actually run on a Mac Plus – most bulletin boards run on PCs. As with Buz Board, it will take about a day for you to be 'validated' after you first log on, then you will be able to use all the facilities of the board. (Validation, incidentally, just involves the sysop checking that your name isn't on a blacklist of people who abuse bulletin boards, leaving obscene messages and uploading viruses.)

Once you've logged on to any or all of these services, why not drop me an e-mail message and let me know what you think of the column; on CIX my user name is 'wrigley', on the other two I'm 'Ian Wrigley'.

And just to round things off, let me give another plug for my favourite modem – the Teleport, from Global Village Communications. It's a 2400baud MNP5 device for the incredibly low price of £179 (plus VAT). It connects to your Mac via the ADB port rather than the modem port, but to all intents and purposes it works just like a normal modem. I use it all the time simply because it's about the best I've come across. It's distributed by Computers Unlimited, and is available by mail order from the company's subsidiary, The Software Club. Call 081 205 4548. Even better, when you buy it from Software Club it will only cost

POSTCARD FROM AMERICA

The Lord High Executioner has a little list, and so have I! It's not filled with the names of foolish software moguls (okay, you caught me. I have that list too!), but of computer hardware and software deficiencies. Here is the first of a half dozen complaints I will remedy when I rule the world:

All computers, and computer peripheral devices larger than a hard-bound book must have a handle or two!

Why do the top-notch engineers that design the shells for our techno-toys think we're not going to move them around – especially since we end up dragging them to the repair shop every other month?

I'm always straining my back, and other more delicate portions of my anatomy, lifting monitors, and printers. A couple of built-in handles, like the kind found in the award winning "Compact Macintosh," would give users some physical, and mental stress relief.

Monitors are the worst. They are not only heavy, but cumbersome as well. My

Apple colour monitor inflated to a grand piano when I carried it a few blocks. Unfortunately, damage by dropping is not covered under warranty.

I acknowledge that I'm surrounded by people who move their computers frequently. Perhaps more often than the typical Joe/Jane user. Members of BMUG, the Berkeley Mac Users Group, hand carry their own Mac II system around town for their weekly meetings. I cart my system to shows, and into bed when I get the flu. This is real hauling, not just shifting across the room. But everyone needs to shift their machines from time to time, perhaps to get at the cat hair under the hard drive. When I rule – handles!

Small tip: I often have the devil of a time fitting cable plugs into device ports, especially the eight pin mini-circular jobs used on the ImageWriter II. Take out your permanent felt-tip pen, and mark the plug and printer case. I like big black dots. This will not hurt the resale value, and will save you a dose of cable fumbling.

David Morgenstern

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RUMOURS...

Most ridiculous piece of software of the year award nominations are flooding in to Future Towers already. The leader so far is something called *Negotiator Pro*, from Beacon Expert Systems, Inc., of Brookline, Massachusetts. (That's the US of A, in case you hadn't guessed.)

The program asks the user questions, from which it creates "a profile of the user's negotiating style, as well as that of his or her opponent." It analyses those two profiles and helps the user draft a winning negotiating strategy. Apparently, one US attorney

who used the PC version of the product to negotiate a prison sentence for his client down from seven years to four.

If this sounds like something you're interested in, you're mad. But, if that's the case, phone Beacon on 010 1 617 738 9300 and be prepared to be negotiated into handing over \$299.

Latest rumours of the new Mac laptop that Apple and Sony are (probably) developing have appeared in US magazine *MacWeek*. It reports sources as saying that the machine will include a 16MHz 68000 processor, 2Mb of RAM and a 20Mb hard disk – but no floppy drive. For an external floppy, users will probably have to shell out a couple of hundred extra dollars on top of the computer's expected \$2,500-or-so price.

Ian Wrigley



TOTAL RECALL

Arnold Schwarzenegger and I have a lot in common. Oh yes. To within the odd pound or so, we both weighed the same when we were born. And we've both got two arms, two legs... oh yes, we've a lot in common. Of course, he went on to become a multi-millionaire film star with a physique like the side of a house, whereas I've gone on to edit *Amstrad Action* and develop the physique of a malnourished potato, but, well, c'mon, he's still got time to make something of himself...

But then, he's been to Mars, and I haven't. Or at least, he has in *Total Recall*. Have you seen the film? Well, it's memorable in one way, at least. And it's not the plot – which is reminiscent of pulp sci-fi from about forty years ago. No, the best bit is the way the characters' faces swell up when they are exposed to the ultra-thin Martian atmosphere. Their eyes go all goggly and their faces turn a funny purple; they grab their throats, their tongues come out and their heads expand like a balloon and... dammit, you don't get to see the ultra-gory bit you've been on the edge of your cinema seat for. (I sometimes wonder if I need help.)

Total Recall the game follows the usual Ocean film tie-in formula of picking a few key scenes from the film and turning them into individual game stages. There are five separate stages, each in one of two styles – scrolling platform beat-'em-up, or horizontally-scrolling driving

stages. They all loosely follow the plot of the film... and beyond that, there's really not a lot to say.

Nothing about the game is exactly mould-breaking, but Ocean has yet again succeeded in turning out a beautifully polished and well-executed film licence. The soundtrack is good, consisting of decent spot effects during the action and a rather good title tune, but it's the graphics which really steal the show. Your Arnie sprite in the beat-'em-up stages is big, hard and well-animated (but does Arnie really sport the jet-black sideburns of a BR porter?).

The game is tough but eminently playable. There isn't a huge variety of game styles, but what there is so well done it would be churlish to criticise it. A definite must for all Arnie and film licence fans.

ARNOR IS BACK!

Biggest news this week has to be the fact that Arnor is getting back into CPC software. It's true – the originator of the fabulous *Protext* word processor, after a break of a couple of years in which we all thought it had lost interest in the Amstrad range, has come up with a new addition to the *Protext* family.



• *Total Recall* is the usual scenes-from-the-film fodder, but the graphics are excellent and the game as a whole is beautifully polished. Two of the five stages consist of horizontally-scrolling driving action. They're not as good as the platform stages, but they add variety.



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Called *Prototype*, it's a "print enhancer" which is designed to work alongside *Protext* and its add-on modules and can be used with any Epson-compatible printer. Although designed as part of the *Protext* family, however, it can be used with other programs, even *BASIC*.

Prototype's specifications are as follows:

- Seven fonts with subscript, superscript, underline, box, encircle, mirror imaging
 - Right justified proportional printing with any combination of fonts and kerning
 - Tabulated proportional text
 - Line graphics
 - 54 extra characters on-screen including accented letters, accent keys defined
 - Multiple accents on any letter
- I can't wait to get my hands on a reviewable copy, and according to Arnor the program should become available towards the end of April. Price will be £30.

SD'S "SPRING OFFENSIVE"

While Arnor has surprised everyone with its return to the CPC field, SD Microsystems, champion of serious software for the CPC, is launching a "spring offensive" with five new programs. These include *Picture Disk*, which contains some 400 pieces of clip-art converted from the American public domain, *Home Finance*, *DiscBase* ("The only fast disk-file organiser for CPC machines."), *Graph-Master* ("a specialist package for creating ten different types of graph") and a special free disk utility ("the usual list/run/print/erase commands but all on single-key presses and with a useful un-erase option") given away with each order.

SD Microsystems programs cost in the region of £12-15, and represent good value. For more details (and information on some of the other bargains on offer), write to: SD Microsystems, P.O. Box 24, Hitchin, Herts SG4 0AE, or call 0462 422897.

CARTRIDGE COMPLAINTS

Barry Marsden, of Slough, is fed up. And so, for that matter, am I:

"I am not only finding difficulty in obtaining cartridges (the only outlet seems to be Dixons) but also in getting games on disk. My local computer shop announced that they are no longer stocking Amstrad disks, and that the larger retailers, like W H Smith and Boots do not seem to want to know about them either.

"It begins to look like a conspiracy on the part of Amiga/ST stockists to run down Amstrad, in favour of the more expensive (and more profitable?) 16-bit machines and games. My son is

thoroughly disenchanted with Amstrad now, having saved up for some considerable time to buy a 6128 Plus, and is beginning to wish he had bought an Atari ST, despite the fact that he would then be unable to play all the games he has collected for his 464 over the years. Am I imagining things, or is there perhaps a case for suggesting that the Monopolies Commission should investigate!

"Certainly it is up to us Amstrad users to keep on at the retailers until they get the message that there is most definitely a market for Amstrad games on disk, and if they don't realise it then they will lose out. They may not understand the advantages of Amstrad machines over the 16-bit brigade, but they will understand Profit (with a capital P). So get out there and get agitating, all you Amstrad users!"

Well, first of all, Barry, may I say that if you've succeeded in buying cartridges from Dixons, you've done better than I have! I asked in our local branch, and was told rather disinterestedly that they didn't stock them, and I should look elsewhere.

It's interesting that you say your son is disenchanted with Amstrad not because of the hardware compared to that of 16-bit machines, but instead because of the poor software availability. Whether or not the availability of disk-based software is becoming a major problem, the availability (or lack of it) of cartridge games is a problem already.

Someone, somewhere, has bungled badly, and despite Amstrad's promises of last year (12 titles available by Christmas 1990), cartridge availability is still minimal in most areas. Amstrad is adopting its now characteristically aloof attitude and insisting the problem the publishers' alone now - but what happened to the much-vaunted co-operation between Amstrad and the publishers, the co-operation which led to the specifications and design of the new Amstrads in the first place?

Amstrad would have to be naive indeed to imagine that the job was done once the machines were in the shops. Of course not! You need to establish a large, and growing, user base to make a new machine successful, and you can only do this by ensuring continuing dealer and publisher support. Unfortunately, there seems very little evidence of either.

Sorry to sound so gloomy, Barry, but it gets me annoyed. The Amstrad Plus machines and GX4000 console are excellent products at a good price. But if they succeed in the years to come, I now suspect it will be despite Amstrad and not because of it.

Rod Lawton



MICROSYSTEMS SLASH PRICES

Those of you looking to use your Amigas for a little bit more than the usual alien-wasting action will be pleased to learn that US-based MicroSystems Software has substantially cut the prices on many of its Amiga applications software.

If you're looking for a powerful word processor with just about every bell and whistle imaginable, then MicroSystems' *Excellence! 2.0* is the package for you. The previous release of this powerful package would have set you back over £200, but in a fit of generosity MicroSystems has slashed

the price to just £117. If you read my mini-review two weeks ago in *Express*, then you'll already know my opinions of this package. Put simply, *Excellence!* 2.0 is the best thing since the invention of the toasted sandwich maker.

Excellence! 2.0 boasts powerful indexing features, immense spell checking and thesaurus facilities, plus full support for multiple fonts, IFF graphics and even printing to PostScript-compatible devices.

MicroSystems has also slashed the price of its integrated package, *Platinum Works*. The package, which comprises of comms, database, spreadsheet and word processing modules, is now available for just £90, making it one hell of a bargain. If you're after a complete one stop solution, then *Platinum Works* is the answer. Indeed, it's so good that Commodore now bundles it with the Amiga 1500 PHC, which probably goes some way to explaining why the price has been dropped so substantially (it was previously sold for £199).

If you feel that you don't really need the databasing, spreadsheet and comms modules of *Platinum Works*, then the company's *Platinum Scribble!* is still available. It's not quite in the same league as a package like *Excellence!*, but then it is almost £70 cheaper. None the less, it has both spell checker and thesaurus facilities for just £50.

All three of these packages (and more) are available from MicroSystems' UK distributor, HB Marketing. Give them a bell on 0753 686000.

MUSIC FOR THE MASSES

As reported in last week's *Express*, Teijo Kinnunen has released a major upgrade to his acclaimed PD music creator MED (available from Amiga Nuts United on 0703 785680).

Version 3.0 boasts many enhancements over previous releases, including the following:

Sample editor Now you can fine tune your samples with MED's built-in sample editor. Chunks of sample can be cut, copied and pasted, sections filter and even entirely new samples grabbed when the necessary hardware is connected to the parallel port of your Amiga. Now there's no need to edit your instruments in a separate sample editor such as AudioMaster.

Synth sound editor For all you acid freaks, MED 3.0 now has a powerful analog synth sound editor which attempts to emulate the workings of the infamous SID chip which is to be found

within Commodore's 8-bit Amiga, the C64. Now you can create all those sweepy analog synth sounds that seem to be so trendy these days.

Hybrid sounds Not content with synth sounds, you can also use Amiga samples as your raw materials and shape them using MED's powerful analog synth editing tools. Roland and Korg have been doing it for years, so why shouldn't the Amiga!

MIDI support MIDI support has been enhanced beyond recognition. This new release boasts extensive MIDI synchronisation options which allow MED to both control and be controlled by MIDI compatible devices. MED will also now take notice of MIDI 'key-up' messages, which allows you to define the duration of a note. Other MIDI enhancements include MIDI reset and support for MIDI pitchbend and modulation.

Chords Bit rusty when it comes to entering chords? If so, then let MED do the hard work for you with its automatic chord entering system. All you need do is press a single key and MED will generate the chord for that note.

Sounds too good to be true, doesn't it! **2.0 Compatible** Yep, A3000 users can also get in on the act now that MED has been fixed to work under Kickstart 2.0.

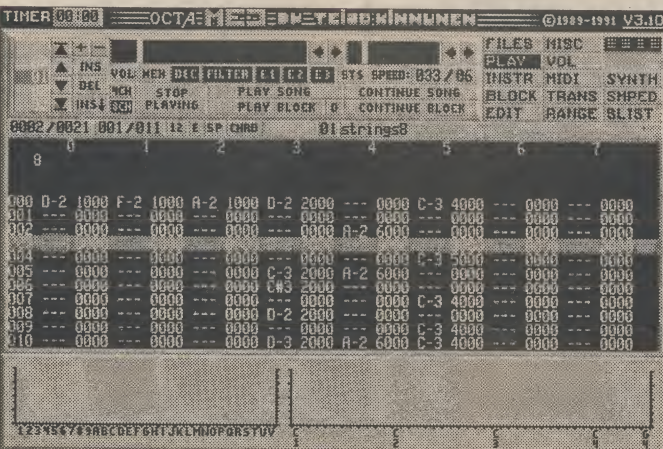
OCTOMED PREVIEW

On the subject of MED, here's an exclusive sneak preview of Teijo's soon to be released *OctoMed* system. The program's still very much in development, but you can probably already see that Teijo has cleaned up the user interface substantially. The new program now runs in Medium resolution, so many of the gadgets are much better defined.

Cosmetic considerations aside, by far the major new feature of *OctoMed* is the fact that it can handle up to eight sounds at once. Don't worry, there's no extra hardware to buy - the standard Amiga sound chip is pushed to its very limits to allow each channel to play two samples simultaneously.

Sounds good so far, but the best news is the price of *OctoMed*. Teijo had previously intended to pitch the product at about the £50 mark, but this price has been slashed to an unbelievable £10. According to Teijo this decision was taken to allow as many Amiga users as possible to buy *OctoMed*.

Anyway, that's about all there is to say about *OctoMed* for the moment, but I'll bring you more as soon as I hear it. In the meantime, contact AmigaNuts United on 0703 785680.



• OctoMed: Eight channels for the price of four. Can't be bad, matey!

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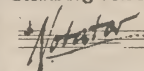
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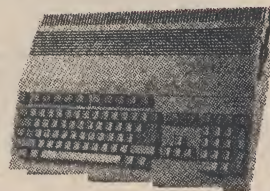
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SURE CANDID!

Following on from the announcement that it is to take on the official distribution of all INOVAtronics products, Checkmate Digital Ltd has announced the formation of a new PD library designed to complement INOVAtronics products, specifically its applications generator system, CanDo.

The new library currently contains only a small selection of disks, but Checkmate main man Steve Jones hopes that CanDo users will contribute to the library by sending in their own CanDo decks. In return, Steve has set up a regular competition which will reward the authors of the best CanDo decks with some exclusive INOVAtronics merchandise including CanDo T-shirts.

Steve sent me a selection of the existing CanDo library disks and I can certainly say that I'm impressed. Each disk is jam-packed with decks (usually at least 12 to 15) ranging from simple games to serious utilities.

Although I didn't manage to see it for myself, Steve even claims that INOVAtronics has even produced a complete home finance package using

CanDo which will be available soon through the CanDo library for little more than the price of a disk.

You can find out more about the CanDo PD library by contacting the Deeper Domain, which is managing the library, at 128 Portland Crescent, Stanmore, Middlesex HA7 1NA. I'll be bringing you a full review of the CanDo system itself very soon, but until then, more can be gleaned by phoning Checkmate Digital on 071 923 0658.

WRITE TO ME!

Feeling frustrated? Unable to sleep from the pent up anger within you? If so, then let it all out by writing to me. If you've got something to say which you think would be both beneficial and of interest to other Amiga owners, then I want to hear from you. Similarly, if you have any great tips or tricks for just about any Amiga product under the sun (not just games - I'm just as interested to receive tips for such packages as *Professional Page 2.0*, *Music-X* etc), then get writing. Send your letters to me care of the usual Express address.

Jason Holborn

Archimedes**GIVE US A BREAK**

I have just seen the last of that white rabbit. Yep, you've guessed it, I've finished *Wonderland*! Although the last couple of puzzles were rather tricky, on the whole the game is relatively simple and very easy to get into. So much so that even my girlfriend and her sister ended up playing it and they put up quite a fight before I could wrest my computer back off them.

Another popular game with my girlfriend has been Superior Software's *Master Break*. As I believe I first mentioned in *Express 108*, *Master Break* is a pretty standard trivia game based on that 'classic' DLT radio quiz *Give Us a Break*. The difficulty of the questions increases the higher the score of the ball - ie reds are the easiest while the blacks are the hardest - and you have a limited amount of time to select an answer from the four provided. A correct response will 'pot' you some points and allow you to continue your break.

Although the game did have some initial appeal, I rapidly became bored with it. Graphical and musical questions are occasionally asked, but do not really add much oomph. The whole game is written in Basic, and the questions stored in plain text files. There is nothing wrong with this, but does leave the game wide open for the cheater!

The worst thing about the game is the excessive amount of time spent in fading the display between one screen and the next. Occasionally three different fades are used one after the other!

Master Break is the best trivia game I've seen on the Archimedes (but that's not really saying much!). If you like trivia games, then you'll probably like *Master Break*, but I personally think that you need to put more into a game than simply asking questions. Superior Software is on 0652 58585.

MENTAL ARITHMETIC

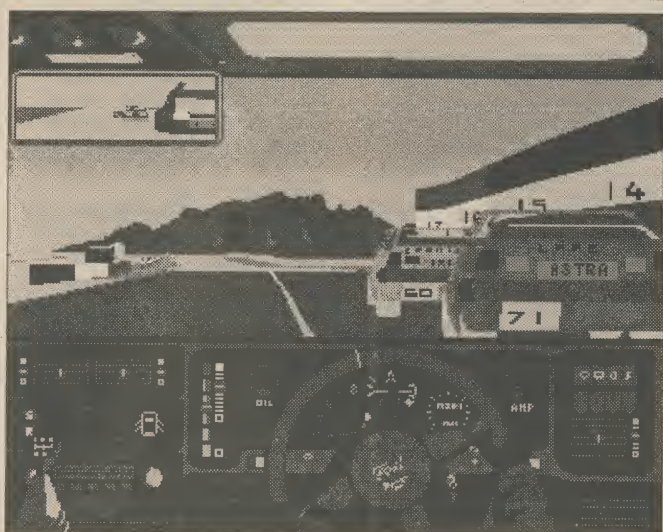
Cambridge International Software seems to have been quite quiet recently, although its *Professional Integrated Project Manager* is now available, as is *Mental Maths*.

I've seen the latter and it seems to be quite good. It's designed to make learning simple mental arithmetic fun by turning it into a game. Four numbered wheels are displayed on the screen. These rotate slowly and it is up to the player to spot a correct 'sum' by clicking on the relevant numbers. Addition, subtraction, multiplication and division are used, along with numbers up to 1000 thus catering for National Curriculum levels 1 to 4. Don't rush out tomorrow and buy *Mental Maths* - expecting a fast moving, all action arcade game, but teachers and parents should take a look. CIS can be contacted on 071 833 4023.

THE ULTIMATE GAME-ULATION?

Saloon Cars is to be the next game, or rather, to be precise, 'The Ultimate Game-ulation', from 4th Dimension. According to the press release all the maths in the game were worked out by a physicist at Manchester University and you'll be able to pull two or four wheel skids, and even hand brake turns.

I don't know how well this will all come across as it is notoriously difficult to translate exact calculated physics onto a very two dimensional game screen. You can drive an Astra GTE, BMW M3 or Sierra Cosworth around Brands Hatch or Silverstone, each course complete with grandstands, bridges and pitstops. Apparently the author spent a large amount of time digitising Silverstone last year to get the game geographically perfect. The only problem is that over the winter, Silverstone has been completely rebuilt and the circuit dramatically changed. Perhaps if some less wild claims about



• *Saloon Cars* contains an historically accurate record of Silverstone, though the author's original intention was to have an up to date one.

the game's accuracy had been made it wouldn't be so funny!

Nevertheless, *Saloon Cars* sounds to be quite fun and a lot better than *Powerband*.

Finally, while I'm still on games, look out for the *Chock's Away Extra Missions* disk. I've yet to see a copy of this myself, but I should imagine there is many a *Chockie* eagerly awaiting one! More news as soon as I can.

LASER DIRECT

Here's a little bit of information that I've been meaning to impart for quite a while now:

How does Computer Concepts produce 600 dots per inch (dpi) output from its Laser Direct Hi-Res on 'an ordinary 300dpi printer? Well, actually it doesn't. Or, to be precise, it does but it isn't an ordinary 300dpi printer. Well, actually it is... Here, let me explain.

The Canon LBP4 printer is, to all intents and purposes, a 300dpi printer based on the Canon SX engine. However, it is possible to bypass its usual control circuitry (which is what the Laser Direct board does), modulate the laser beam and thus control the size of dots 'plotted'. This result is true 600dpi printing. (The Hi-Res board is also capable of 600x300 and the more usual 300x300 resolutions, so you can trade off available memory for image quality.) This real problem with output at the only resolution is that you need an A440 at the very least to be able to hold the image which can be up to 4Mb! Still, at around the £1,500 mark it is the cheapest way to get high quality output on the Archimedes.

If you couple this with £150 for CC's ShowPage PostScript preview

application, you get an extremely cheap entry point into the wonderful and exciting world of PostScript.

DID YOU KNOW THAT...

ARM machine code instructions do not all execute at the same speed? Most obviously instructions like STR and LDM take longer than MOV, ADD and so on because they are accessing 'slow' memory (MOV and ADD work solely on internal registers and can thus bomb along). MUL and MLA also take a while longer than the wholly internal instructions. However, the speed of these 'slow' instructions can be quite dramatically altered by changing their position in memory.

All instructions have to be word aligned (ie on a four byte boundary), but some instructions work better on certain word alignments than on others. I found this out quite by accident the other day while writing a super fast circle plot routine. My actual dot plot had a couple of bounds checking instructions to start with, to ensure the dot plotted was actually on screen. The plotting was done with a little address calculation and an STRB instruction. I timed the routine for a 1000 circles, and then re-timed it with the bounds checking commented out. Much to my amazement it worked about 20 per cent faster with the bounds checking in! All because the STRB had moved to a 'better' alignment.

I mentioned this to a friend who told me all about it, and showed me all sorts of other ways of speeding up (or rather, not slowing down) ARM code. If I have space in a future column, I'll pass on the information.

Ken Coumarin



NEW PILOT, SAME COURSE

Those of you with the extraordinary ability to read 300 words per second will have already realised that a different pilot sits in the cockpit of this esteemed column. I know what you're thinking:

"How can ANYONE follow such an entertaining and intellectually stimulating person as Sean?" I can. I'm no stranger

to the C64, and currently my pearls of wisdom adorn the Gamebusters page of *Commodore Format*. And rest assured, the consistent quality of this column will remain unchanged. (Ish)

CONSOLE IS NO LAUGHING MATTER

Sean Masterson left us on a rather poignant note a couple of weeks ago,

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that of Commodore's shock withdrawal of the C2N Datacorder. One can't help feeling rather confused - Commodore stated that by bringing the price of the C64 down people would be encouraged to buy it rather than the C64GS. So what was the point of releasing the GS in the first place?

Many of the industry cynics will no doubt see this as the end of the C64, those with any common sense won't. One could argue that with multiloop games being ported onto cartridge and the ever-expanding budget scene taking over, the disk drive will be pushed out into the cold. We can only speculate for the time being. Personally I see the C64 going from strength to strength, as owners without a C2N will undoubtedly buy one as an enhancement (as soon as they tire of extortionate cartridges). It just goes to prove what an unpredictable industry this is - the mention of a C64 console would have had people in stitches 18 months ago.

DO YOU HAVE THE POWER

If you have a passion for fast-action games but don't have the money to support it, you'll probably welcome Ocean's latest compilation offering. The affectionately labelled *Power Up* features five games, with all but one providing great entertainment.

Altered Beast is a highly accurate and playable coin-op conversion, sporting huge main players and even huger adversaries. The graphics are blocky but effective and the sound is rather mellow (if a touch inept).

Rainbow Islands is the perfect example of a modern classic; within weeks of its release it had built up an enormous following. Sickly sweet graphics and music subtly contrast with the fast-paced gameplay, and each level oozes variety and imagination. A spot-on conversion.

X-Out follows the trend of a million and one R-Type clones, yet remains fresh enough to excite the most ardent of shoot-'em-up fans. Graphics have a suitably 'murky' feel, while the music and effects have been accurately converted from Chris Huelsbeck's original 16-bit tunes.

Turrican is undoubtedly the cream of the crop, and indeed the most recent. Solid blasting over five gargantuan levels, each with its own unique graphic style (plus a huge array of repulsive creatures). It also features the largest end-of-level meanies ever to grace the C64.

Chase HQ is the runt of the pack, with repulsive monochromatic graphics (blue and yellow - I ask you). Control of the car is sluggish and unresponsive, and sound is abysmal. Still, you can't have everything I suppose.

Power Up will be available within the next fortnight, and you'd be rather nutty to miss it. Owing to the recent VAT increase the cassette/disk prices have yet to be announced. We'll keep you posted.

BAD TASTE

Now that the Gulf war has thankfully come to an end, numerous television programmes have started to reappear after having been withdrawn during the conflict (such as *M*A*S*H*). I wonder how many software retailers withdrew 'sensitive' games over the war's duration? Here are a few titles which I would have deemed unsuitable for sale during the past three months; *Operation Wolf/Thunderbolt*, *Rambo III*, *Strike Fleet*, *Swiv*, *Navy Seals* and of course *Saddam Hussein Simulator*.

MEET TRACEY

Being an extremely kind individual (not to mention modest) I feel obliged to bring Tracey to your attention. Don't get

MASTERING CLUEDO

Finally this week, a game which will exercise your brain cells rather than the trigger finger. *Cluedo Master Detective* from Virgin is a conversion of the American board game (which hasn't yet surfaced in Britain). Compared to the original it offers six more rooms, 4 extra characters, and an additional 3 weapons. Sounds good already.

Play follows in the traditional fashion, with players taking guesses as to 'whodunnit'. Up to ten players can take part, being either human or computer controlled, and the game tends to roll along at a merry old pace.

As with many board game conversions the other players will have the advantage of seeing your cards when they shouldn't. This is probably the only gripe on what is actually a super little game. Rush out and buy it on cassette (£9.99) or disk (£12.99) or you might just find yourself stabbed to death in the drawing room.



• Cluedo Master Detective: even more ways to murder Doctor Black

too excited though, as Tracey is simply a little bit of clear plastic that fits rather snugly on to the side of your mouse. Apart from looking quite trendy it also makes the copying of photographs and pictures an incredibly simple task.

It can be positioned on either side of the mouse, so that both left and right handed people can use it, and can also be removed when not in use. Tracey was created for use with 16-bit machines, but it works equally well with on my C64 NEOS mouse. It costs a mere £7.95 and can be obtained from Sidewise Ltd, PO Box 4, Totnes, Devon, TQ9 7EN.

MORE CREATURES

Fans of *Creatures*, the incredibly cute arcade adventure from Thalamus, will no doubt scream with delight at the mention of *Creatures 2*. Without giving too much away, the horizontally scrolling stages have been dropped in favour of masses of torture screens (which made the original so good). These screens will be interlaced with a fast bonus game where you can pick up

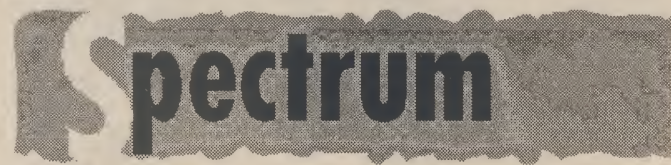
bonus points and weaponry. If that has whetted your appetite then don't miss *Express* next week, as we'll have a special preview just for you!

Each week, I hope to bring you a few 'Top Tips' to help you get the most out of your C64 without splashing your money around, and this week's is a real gem. Have you ever seen the anti-glare screens to reduce eye-strain? Have you ever choked on the price of one of those things? Well if you spend lots of time at the word processor (or even programming) and your eyes are feeling the strain then simply turn the colour down on your TV or monitor! Simple but extremely effective – the gray shades are less harsh on the eyes (take it from one who knows).

THE LAST BIT

If you have any hints, tips, or criticisms then paint your nose blue and stand on a grape for three hours or, if you'd prefer, send them in to me at the usual *Express* address, 30 Monmouth Street, Bath, Avon BA1 2BW.

Andrew Roberts



INDIE RAVE 2

More software of a decidedly adventurous persuasion to report on this week. Last column I shocked and fascinated you with a rave review of Zenobi Software's bargainastic *Best of the Indies* compilation and this time I'm going to tell you about the second similarly excellent volume called, er, *Best of the Indies Vol II*, would you believe. This one comprises another six prime cuts of independent adventure software that you could slap in a big box with a novella, map and poster of scantily clad princess and charge £15 for without any problem. Thankfully Zenobi save trees with a photocopied inlay and takes a wallet and maintain a purse-friendly stance with a £4.99 price tag. You get a lot of adventuring for your money too.

First up is *Crack City*, which gained a Mega Game when reviewed in *Your Sinclair*. It is a very good, eminently professional drug busting adventure that thankfully doesn't look like it's been written with the PAW utility.

Following that is my favourite of the bunch, an atmospheric gothic horror in two parts called *The Hermitage*. This is actually quite scary with prose that's purple in style and dripping healthily with blood. There's a deep sense of evil pervading both your character and the world around him. It had me reaching for the comfort of my teddy bear I don't mind admitting.

The high standard is maintained by *Gordello Incident*, another from the deviously warped mind of Tom Frost. It's the sequel to the duplicitous *Double Agent* and employs similar double standards as a split screen lets you control two clones. Complications arise because one always does the exact opposite of what you type. According to the bump not even the author has managed to finish it yet! Two parts are included on the compilation and if you

struggle through them you can send off the last bit at a reduced rate.

Zenobi's own contribution to the compilation is *From Out of a Dark Night Sky* which has a sort of '50s sci fi movie plot with alien pods landing on Earth. Again, a good atmosphere is created with some prose that's lilac if not quite purple and it's pretty compulsive to play with some nicely constructed problems.

Also good is *Bounty Hunter*, a solid and dependable quest with a huge 1500 locations although I didn't see quite that many in my short lived go.

Finally, another game of two loads, *Diablo*. And very good it is too with a stack of trendy features that you don't expect to see implemented on the humble Speccy and a story that, for once, doesn't read like a three way collaboration between Jeffery Archer, Exchange and Mart and a nameless sci fi/fantasy author plucked from a Woolworth's bargain book bin. *Diablo* is among the most professional looking indie adventures I've seen and as Mike Gerrard (*Your Sinclair* adventure columnist) remarks in the accompanying waffle, "It deserves the widest possible audience."

All in all then, *Best of the Indies Vol II* is another corking collection of adventures and represents the best value for money package I've seen since, erm, the first volume! Get your copy or more information (with SAE) from Zenobi Software, 26 Spotland Tops, Cutgate, Rochdale, Lancashire OL12 7NX.

Anyone interested in adventures would also do well to ask nicely for Zenobi's vast back catalogue of the things.

SAM MATTERS

There are some pretty interesting developments for the SAM Coupé nearing the end of several pipelines.

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DEALER ENQUIRIES WELCOME - PHONE OR FAX FOR QUANTITY PRICING

Good old Phil Glover of Birmingham seems to know about quite a few of them and has just written to tell me.

Most impressively, Steve Nutting of SC Assembler fame is apparently developing a 256K RAM module with a battery back up that preserves data even when you switch off. There's also a rumour about a 40Mb disk drive!

Adventuring types with a SAM should also be pleased to hear that Gilsoft is thinking of writing a Coupé version of its *Professional Adventure Writer*.

Phil also related an interesting tale of contrasting customer service that I reckon is worth sharing.

"On reading this week's Spectrum column in *Express* I was surprised to see this week's episode in the INDUG/FORMAT saga was missing. Joking apart, I've had quite enough of Mr Benchly. In the last year INDUG was supposed to send me two tapes I'd paid nearly £10 for and two copies of FORMAT, none of which have arrived. After numerous letters and phone calls Mr Benchly claimed that he'd sent the goods, and if they haven't arrived then I have to take the matter up with the Post Office. I've received dozens of tapes and magazines in the last 12 months, but it seems that only INDUG stuff goes astray... Most mags/clubs and adventure mags/software publishers nearly fall over themselves to help correct the trouble, even if they're not strictly liable. I believe it's called customer care."

On a happier note Paul goes on to congratulate BG Services who took the

trouble to ring saying there would be delay in sending him one of their Samplifier. Apparently this is "a great little gadget which really shows off SAM's chip in all its stereo glory." Sounds good. Thanks to Phil for the info and letter!

CLASSIC POKE

Here's a poke for a crusty old game of yesteryear. *The Way of the Exploding Fist* wowed your grandparents when first released in 1809 or thereabouts and proved the inspiration for the several thousand martial arts beat-'em-ups we've suffered since then. It's still a veritable corker mind you and pretty hard to complete if only because you need about 23 fingers to perform all the moves at your disposal.

The hacker responsible is the increasingly prolific Steven Kemp of York. Whoop! and riotous applause for him. As per blooming usual he wants me to say hello to someone. So hello Neil "I ain't doin' no lines Miss..." Roberts wherever and whoever you are.

1 REM Way of the Exploding
Fist by Steve
10 LOAD "" SCREEN\$
20 LOAD "" CODE
30 POKE 40099,182
40 POKE 44386,201
50 RANDOMIZE USR 39982

Line 30 gives infinite time and line 40 stops the score from going mad.

Thanks again Steve!

Robin Alway



NEW ATARI CD-ROM

The all new Atari CD-ROM, codenamed the CDAR505, was shown at the CeBIT show in Hanover, Germany, last month. It has both a SCSI and an ASCII interface. Along with the software included with the unit you can use with all of the entire ST range. Massive amounts of data can be stored on the unit which has a capacity of 500Mb.

The software used by the unit is the *Cobra* retrieval package. It also has the advantage that you can use it as a standard audio CD player on its days off. Price will be about £200, making it an extremely attractive buy.

On the subject of the ST Book, it has recently been revealed that an internal modem will be available on the computer's release in spring 1992. It will be capable of all the usual comms functions, as well as the ability to send and receive FAX messages. The price of the ST Book should cost around the £1000 mark, making it an extremely attractive purchase.

PAGESTREAM 2 IMMINENT

Deron Kazmaier, the president of Softlogik Publishing Corporation, has come clean about the new version of *Pagestream*, the popular desktop publishing program. Version Two has

been eagerly anticipated for so long that the folks at Softlogik has got severely ratty at any suggestion of an update. However in an on-line conference recently Deron spilled the beans and announced that *Pagestream* 2.0 would be ready within the next couple of weeks.

Although firm details are very thin on the ground, several of the new features were revealed during the conference. One of the most powerful features of *Pagestream* is the file importing formats. Added to the new version are TIFF, MacPaint, GIF, ProDraw & DR2D (which are object oriented Amiga drawing formats) along with IBM EPS formats and an IMG print to disk driver (which would be mainly used for faxes).

Font handling has been tweaked. Existing *Pagestream* fonts can be used, but on-screen outlines will now display point sizes above 26pts, bitmaps will print to dot matrix for very small sizes, Adobe Type 1 outlines are implemented, as are Adobe bitmaps, AFMs and CompuGraphic Intelifonts. All these fonts can be matched up to each other, making life considerably easier.

Linotronic support has been considerably improved. EPS files are now much better supported. This fixes

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things like clipping and it also makes it work better with illegal EPS files. Colour handling has been vastly improved. It is now possible to enter colours via a full CMYK box. If you import an EPS file that includes custom colours, it will add those to your colour palette.

So, if you own Adobe Illustrator, you can import a file from it, call Pantone EPS and get all the Pantone colours.

Atari's new FSM-GDOS provides scalable fonts which are on a par with PostScript and the like. Deron revealed that future updates of Pagestream would support FSM-GDOS if it took off.

Pagestream itself will run quite happily with just one megabyte of memory. No British price has been announced yet, but Pagestream 2.0 in the USA costs \$299.95, while upgrades will cost \$75.00. This includes all the new disks and two new manuals. Pagestream is distributed in this country by Silica Systems who can be contacted on 081 309 1111.

ADVENTURE IN SPY-SNATCHING

I'm not sure why, but adventure games are few and far between on the ST. The Infocom range was converted and the Magnetic Scrolls range provided many hours of enjoyment, but where are they all now? The good news is that a small software house has entered the ST adventure foray by converting some of its popular 8-bit titles to the computer.

Topologika has been knocking out adventure games for a few years now. Two of its more famous programmers are Peter Killworth and Jonathan



• Kingdom of Hamil is just one of the classic adventure games to be converted to the ST by Topologika.

Partington. These gentleman were responsible for the cream of 8-bit adventures in the mid 80s. Its back list includes *Philosopher's Quest*, *Countdown to Doom*, *Return to Doom*, *Last Days of Doom*, *Hezarin*, *Acheton* and *Kingdom of Hamil*. All these titles are now available, suitably spruced up for the ST, though they're all still text.

The hardest of these adventures is definitely *Acheton*, a real puzzler which had me guessing years ago when I owned a lesser computer sponsored by the BBC. With these games it really is your mind that will be exercised, not your caloused and warty trigger finger. On the same disk as *Acheton* you also get *Kingdom of Hamil*, originally an Acornsoft adventure.

Also from Topologika comes *Spysnatcher*. This brand new game,

written by Jon Thackray and Jonathan Partington, is available now for a mere £14.95. The other titles come on two disk packs and cost £19.95.

Bored adventurers should give Topologika a ring on 0733 244682 or write to PO Box 39, Stilton, Peterborough, PE7 3RL.

ST BOOK RELEASE DATE?

I seem to have annoyed Peter Staddon of Atari with my news piece on the new ST Book. The paragraph which particularly annoyed Peter appeared in issue 125 and read: "Atari has said that the ST Book definitely won't be available this year. However, it does seem likely that a spring launch would not be out of the question." So why is Peter annoyed? Well apparently I'm suggesting that Atari will launch the ST Book this year.

I in no way meant to convey the idea that Atari would launch the ST Book this year. What I meant was spring 1992. Anyone predicting a launch date for a piece of hardware would have to be out of their minds to aim lower than the press release date. Computer hardware companies always come in notoriously late on their predicted launch dates. As a computer journalist I know this better than most people.

I'm sorry if you feel that I'm a "wally" Peter, but please give me some credit. Would I directly contradict myself and Atari within two sentences?

Contradictions, I'll leave those to the people that produce the hardware we journalists write about.

Andy Hutchinson

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WHOLE WIRED WORLD

Steve Gold dishes up more international computer news. This week, Atari loses out to Nintendo, and AMD steams ahead with a new 386 processor.

ATARI SALES DROP

Poor old Atari – while a welter of new goodies were tolled out at Cebit '91 last month, the company has just turned in a disappointing set of fourth quarter 1990 sales figures.

During the quarter ending 31 December 1990, sales were down 11 per cent on the figures for the previous quarter. For the full year, the reduction was three per cent compared to 1989. Net income – that's profits to you and me – was quite healthy at \$14.9 million for 1990, compared to \$4 million during the year to December 31, 1989.

Atari officials blame the Gulf War as the primary reason for the decline in sales. However, Atari president Sam Tramiel is looking on the bright side. He said: "Although sales in the fourth quarter were understandably disappointing, the company continues to strengthen its balance sheet. The Atari STE and TT030 computer line, based on Motorola's 68000 and 68030 microprocessors, continues to be a corner-stone of our business."

AMD RELEASES COMPETITION FOR INTEL

Advanced Micro Devices (AMD) has released the AMD386DX-40, a pin-for-pin plug-in replacement chip that is 21 per cent faster than Intel's 33MHz 80386 32-bit chip it replaces. The 40MHz AMD386 has been shipping for several weeks and already some of the smaller customers with 'shorter design cycles' – Northgate, Bell Computer, Orchid Technology and Cybertek – have used the chip in their beta test PC releases.

There are actually two versions of the AMD386 chip – the AMD386DX-40 and the AM386DXL-40 – the latter of which is a lower powered version. According to AMD, the AMD386DXL-40 offers a static design that "dramatically reduces power consumption and extends battery life in portable PC systems."

Sounds good. Even better news is that the new chip is significantly cheaper to PC manufacturers than the Intel workalike. That means cheaper PCs in the longer run.

CENTRAL POINT SOFTWARE GETS ON THE VIRUS BANDWAGON

Central Point Software has released Central Point Anti Virus (CPAV), its first package in the PC anti-virus wars. The software combines virus protection technology with a 24-hour hotline support line, the company claims.

CPAV eliminates and prevents any infection caused by more than 400 known and unknown viruses in DOS, Windows and networked environments, according to the company. The support program also includes a quarterly newsletter to registered owners containing information about new viruses.

Central Point said that its program makes executable files self-protecting. The program also can run as a memory resident module. For users running the Microsoft Windows 3.0 environment on their PCs, a dialogue box alerts the user to virus infections while Windows applications programs are running.

During program installation, CPAV checks for and eliminates viruses from the system before installation, and at the

user's option will modify the autoexec bat and config sys files to automate virus protection.

The package includes full mouse support, context-sensitive help screens and pull-down menus. The program interface can be configured to make it suitable for users with different levels of computer expertise.

Contact: Central Point Software Tel: 0101-503-690-2650

APPLE ROCKS THE BOAT IN THE USA

Apple has upset many of its US dealers by running advertisements in *The Wall Street Journal*, *Fortune*, and *The New York Times* that carried the following line: "Prices shown are suggested retail. But who pays retail anymore?"

According to the 18 March issue of *Computer Reseller News*, some resellers, who are used to seeing firm prices from Apple, were shocked to learn that Apple's advertisements for its new printers carried the strong implication that dealers would immediately discount the printers despite reports that the low-priced StyleWriter and Personal LaserWriter LS are in very short supply.

Apple itself has admitted that demands for the StyleWriter far outstrip supply and that the product would be on allocation for 4-6 months. It has not commented on the furore its advertisements have caused.

SYMANTEC UNLEASHES ANTI-VIRUS PROGRAM

Symantec has powered in with version 3.0 of its Symantec Anti-virus for the Macintosh (SAM) package. The major upgrade to the company's anti-viral package for the Apple Mac now features a series of facilities that the company claims allows it to spot new virus programs as they appear in a machine.

SAM 3.0, available now, has been designed to simplify the updating of virus definition files, as well as supporting a virus repair facility. The program places virus definitions in a separate file – when a new virus or strain is discovered, only that one file has to be updated.

To support the program, Symantec is distributing new virus definition files via on-line services such as Applelink and Compuserve, as well as via its virus news line bulletin boards, which are located in the US and the UK. Virus repair capabilities are included free in the definition update. Previously, a user had to buy a separate disk in order to receive the repair.

One new feature of SAM 3.0 is its 'timed macro' capability. Users can set a time for SAM to begin a scan for viruses, at 3AM, for example, or another time when the system is not being used.

SAM 3.0 supports the newly-released System 7 operating system for the Apple Mac, and also works with earlier versions of the Mac's operating system. The package costs \$99 in the US, with updates from earlier versions available to registered users for \$29. UK

pricing has yet to be announced.

Contact: Symantec, 10201 Torre Avenue, Cupertino, CA 95014-2132, United States.

Tel: 0101-408-253-9600

Fax: 0101-408-253-4092

ATARI AND TENGEN STOPPED ON NINTENDO CARTRIDGES

A US district court has taken the unusual step of issuing a preliminary injunction prohibiting Atari Games and its subsidiary Tengen from producing or marketing any Nintendo-compatible video game cartridges.

The ruling halts sales in the US until a trial is held on the merits of copyright infringement claims by Nintendo. At the same time, Nintendo was ordered to post a \$1 million bond within five days.

Specifically, Atari Games and Tengen cannot sell or distribute either Nintendo's 10NES program or Atari's Rabbit program contained in its NES-compatible home video game cartridges.

Outside the courtroom, Atari vice president Dennis Wood told reporters: "While this ruling will affect Tengen's NES-compatible business, it does not apply to Tengen's other product lines. It also has no effect on Atari Games' coin-operated business. We will take steps to begin an appeal next week."

The infringement law suit centres on the fact that Nintendo uses a security system that prevents non-Nintendo cartridges from being played on its game consoles, part of a patented computer chip contained in the Nintendo Entertainment System.

In 1986, Atari Games started trying to break the code. In late 1987 Atari was licensed by Nintendo to sell Nintendo-compatible game cartridges, still without knowing how to beat the security system.

By 1988, however, Atari Games' engineers had cracked the NES protection system, then the legal hassles began, with each company suing the other. Nintendo alleges copyright violations. Atari, meanwhile, reckons that Nintendo is illegally monopolising the market.

In her ruling for the preliminary injunction, Judge Smith, the judge in the case, said: "Atari decided to make its cartridges 'functionally indistinguishable' from Nintendo's own games by admittedly copying more than was needed to make a game work on the NES console."

Reacting to the ruling, Atari's Wood said: "We believe that the court's opinion makes it impractical, if not impossible, to independently produce cartridges compatible with the NES."

"Given the proliferation of compatible computer products throughout the electronics industry, we find that the court's opinion runs counter to established practices in the computer industry and is an incorrect interpretation of copyright law," he said.

Privately held Atari Games is not affiliated with publicly held Atari Corporation, the Sunnyvale, California-based computer manufacturer. ■

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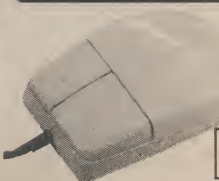
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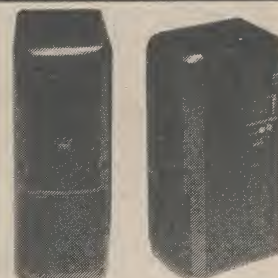
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N.B. Due to the large variance in design of the Atari ST, there is a small minority of boards in existence which may require a little soldering.

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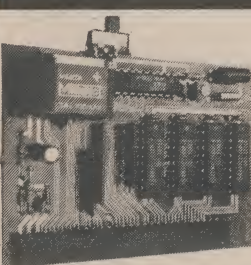
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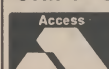
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■ HELP! Basic database

I have struggled for a couple of years to write a database program for my PC. I learned computing on a BBC B which had the BASIC language on a ROM inside it, so this is the language that I feel most comfortable with.

I want the database to record the details of members of a computer club of which I am the secretary. The problem is that as I get the program to work, I think of another utility that would make it even better. I'm on version 12 now and to be realistic it's never going to work properly. All of the bolt-on loops and routines bring with them a time overhead and it can take half a minute to dig out a record.

I come to the conclusion I should consider a couple of alternatives. I can either learn a new language or move on to a commercial program. I was against the idea of a new language but we're changing the computers where I work from PCs to a

mini system and there are a couple of originals of *RapidFile* going free with original disks and documentation.

What I need you to tell me is, would *RapidFile* do the job for me – and is there any way of speeding up my program without learning a new language?

John Fetter, Dulwich

If you want to take the easy way out, *RapidFile* will certainly do the job. It will run on any true XT or AT clone and contains features that will hold your name and address lists, mailing labels, checks, calculations, inventory, form letters, accounts and reports.

To help you even further, there's a spelling checker and a thesaurus. If there's an original going begging, grab it with both hands. *RapidFile* comes from Ashton Tate (themselves responsible for *dBase*) and will be worth its weight in gold to you.

If you want to speed up your own

program, print it out and take a long look at it. BASIC programs become clumsy and cumbersome when you add bits as you need them. It may be that you've done the same sort of routine several times in the program, so perhaps you can combine several routines into one module. This should make the program more compact.

You didn't say which dialect of BASIC that you're using or whether it is compiled or interpreted. If you are using an interpreted BASIC, get hold of a compilable BASIC, make the necessary dialect adjustments and it should run a good deal faster once compiled to code instead of being interpreted an instruction at a time.

■ HELP! Flat ST

What are flatties in my ST? I was hoping to upgrade the RAM from 512K to 1024K but the shop I took it to said that it is a nearly impossible job because the memory is made up of flatties. I have searched the manual and can find no mention of this.

I've since found a company advertising in an ST magazine that will do a memory upgrade to any ST, but first I want to solve the flatties puzzle!

Neil Beecham, Maidenhead, Berks

I think the flatties that you refer to must be surface mounted chips. These are attached directly to the circuit board instead of being attached by legs into sockets. As there are no sockets, your local dealer probably thought that the job would be too much hassle.

It shouldn't be too difficult, and there are several companies which specialise in ST memory upgrades. One of the simplest routes is via a circuit board that fits over the memory management unit in the ST, allowing the memory to be upgraded to 1Mb. If you are competent with a screwdriver and don't mind waving bye bye to the warranty, you could get the board from Third Coast Technologies (0257 426464) and try fixing it yourself.

But only if you're confident of your abilities though. Don't risk a good computer to save a few quid.

■ HELP! CPC cartridge

The CPC plus seemed like a good logical progression, what with its cartridge port and having all of our software on disk, so we bought the new machine. But I have to

say that it is a disappointment. All of the exciting new features only work in the cartridge mode so we haven't made much of a gain on the original machine – unless we buy cartridges.

I've learned enough CPC BASIC to write programs for my own entertainment and have even taught the kids to play screen spirographs with Logo. I want us all to get more out of the machine so it's time to learn machine language or assembler or whatever it is that produces all of the commercial games.

Is there a book which will teach me a bit about low level programming specific to the Amstrad CPC?

J Bragg, Paignton, Devon

There are several books that fit the bill and whichever one I suggest, I've no doubt that someone else will suggest a 'better' one. Still I'll risk it. *Machine Code for Beginners on the Amstrad* (ISBN 0-7447-0025-6 at £6.95) should fit the bill without breaking the bank.

It was written by Steve Kramer seven years ago but it offers a logical, well-defined approach to machine code programming. If you have difficulty getting hold of a copy there are several other books available.

■ HELP! What's in a name?

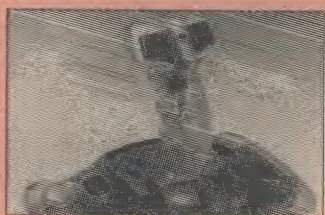
I've heard it's possible to replace the nasty 9-pin printer of a PCW with something better. An article in a PCW mag showed a PCW with a Star 24-pin printer attached. Can I go a step further and run a laser printer from the PCW?

In my office there are two (Epson) laser printers shared by five computers. I noticed a spare 'spur' under my desk and was told there used to be six computers attached to the printers. There is a manual switch box so before you use a printer, you have to switch it to your computer. The laser printers are used in Epson emulation mode and no-one minds if I can add my PCW to the set-up. I use *Protext CPM* on the PCW and I'm sure that this can be configured to drive an Epson printer.

May Vale, Truro, Cornwall

You will need a parallel interface on your PCW in order to connect it to the Epson Laser but other than that it should be plain sailing. You'll need to configure *Protext* so that it knows to drive an Epson Printer instead of the Amstrad

■ HELP! Joystick division



• The digital approach for the Amiga...



• But analogue for the PC version

What equipment or adaptor do I need in order to plug my joystick into a PC? I have an IBM XT clone – plus an Amiga and a couple of joysticks. Now most of the Amiga games only use one joystick at a time so I thought I might as well have the other one attached to the PC. The XT has no joystick socket but I know that most of the PC software can use a joystick – so how do I plug one in?

Ade Walker, Newcastle upon Tyne

First the bad news. The joysticks you use with your Amiga are different to the ones used with a PC and are simply not compatible. The Joystick used by the Amiga and most other computers is digital. That means that as you move the stick to one of the positions, a switch closes and makes a circuit that can be on or off.

A PC joystick is analogue: a couple of potentiometers measure the changing signal across the X and Y axis of the joystick and from their output the PC can work out the exact position of the joystick. This is a more accurate but more complicated system. In order to interface your PC with an analogue joystick, you'll need a Games I/O card. This is generally a half or one third length card with the necessary 15D connection for an analogue joystick.

Now the good news. It needn't cost an arm and a leg to set your PC up for joysticks. A games card can cost as little as £12.50 (Seen recently at the All Formats show) and an analogue joystick can be had for about £20. If this is too much, keep an eye on the Shopping Express reader ads.

nasty 9-pin. Instructions on how to do this are in the *Protext* manual.

The parallel interface connects to the PCW via the edge connector at the rear of the monitor cabinet and a standard parallel cable will connect the interface to the printer. Set the switch box to your spur— and away you go!

■ HELP! Warranty worries

I was asked by Heathrow security to open up my laptop so they could check that it didn't have a Semtex battery. I argued and was allowed to prove that it was a genuine, working computer by loading up and running some software from the hard disk.

The thing that worries me is that, as a regular traveler, I often take a laptop on a plane to work with. So far, it hasn't got as far as disassembly but one day soon it looks as if it might.

If I am forced to take the laptop apart to satisfy the curiosity of security men, will the warranty suffer? Will the manufacturer refuse to look at the machine if it has been tampered with in this way?

AJ Buckley, Thornton Heath

There's no simple answer to this. It depends on the manufacturer. In simple

terms, if you open up a computer this will normally invalidate the warranty.

But if you're forced to open the machine, you should contact your manufacturer and dealer as soon as possible, explain why the machine was opened and ask them to inspect it and confirm that the machine hasn't been affected. They aren't obliged to do this and will probably charge you for the service but with laptops costing up to £8,000, your warranty could be worth a lot of money. If the machine has only been opened for inspection and not damaged there's no reason why they should refuse to reinstate your warranty.

■ HELP! MIDI compatibility

My son pointed out the MIDI ports on his Atari ST when we were planning to buy a keyboard for his sister for a forthcoming birthday. He is under the impression that if we buy a MIDI keyboard for his sister, they will be able to utilise his ST as a multi track recording studio. Is this true? He has a sequencer software package from the public domain for a couple of pounds. Will this be what he needs?

He is right. As long as you buy a key-

board with MIDI ports, you'll be able to use the ST and the sequencer to drive it. If you can get a multi-tymbral keyboard this will be even better as you will be able to assign different MIDI voices to different tracks.

This means that you could, for example, record a bass on track one, piano on track two, strings on track three, a couple of solo instruments on tracks four and five, and percussion and effects on the remaining tracks.

You would also be able to play back your orchestration in multi-tymbral mode playing all of the tracks together. This would be as versatile as the keyboard would allow.

The other good thing about MIDI is that it's expandable. Tracks that you record on a £100 micro-keyboard today will play back on any instrument equipped with MIDI. This means that something recorded at home could be taken to a studio and played back on a £250,000 synthesizer. As your system grows you don't actually lose anything. It grows too.

■ TIP! Punch drunk

I took 25 720K PC disks (3.5 inch variety) and, using a hole punch, added the extra

hole needed to persuade my PC that they are in fact 1.44Mb disks. The hole punch was on the desk anyway and the job took ten minutes. The PC will read and write to all but two which give a media error. That isn't much of a penalty when you consider that I've got the equivalent of an extra 23 disks for free.

What annoys me is that I've spent the last two years and a lot of my firm's money buying the expensive disks.

Roland Watkins, Glasgow

You aren't the first, and you certainly won't be the last, person to realise that a minor modification to a disk can double its capacity.

Although you have what seems to be a low failure rate (eight per cent) you may find that the failure rate increases. The media on a 720K disk isn't as dense as that used on a 1.44Mb disk and people using converted 720K disks have reported a high failure and data-loss rate.

If this penny-pinching approach involves your company's valuable data — think again. That little extra that you pay for a guaranteed 1.44Mb disk is certainly worth it in the long run.

■ HELP! Sounds like an Amiga

After a year of eye-screwing-up we've graduated from a TV to a monitor for our Amiga A500. Following your advice some time ago, I purchased an Amstrad monitor from the Amstrad CPC series and my pictures are much clearer. Unfortunately, the monitor has no sound and although we've successfully connected the twin stereo phono outputs on the Amiga to the hi-fi, Dad doesn't like *Outrun* through his precious Bang & Olufsen. Is there a purpose-made mini stereo for the Amiga or can you suggest an alternative?

Tracey Laing, Telford

There are several companies advertising stereo amplifier and speaker add-ons for the Amiga. For a ready-made solution you could contact Trilogic on 0274 691115. Trilogic does a teeny amplifier and a choice of either car type stereo speakers or rather elegant bookshelf speakers. If you want to mix and match yourself, try your nearest Tandy where they do a variety of amplifiers and speakers.

Although the Amiga has undoubtedly the best sound of any computer, it can still be limited if in use as a sound module for MIDI. If I bought the Checkmate 1500 or Bodega Bay and a bridgeboard, could I run the Roland LAPC1 soundcard or is there a simpler way to achieve this result? It seems expensive but it's what I want.

Tim Emmanuel, Golders Green

A much simpler and much easier way to achieve the same result is to attach a standard MIDI interface to the Amiga and then add a sound module to that using standard MIDI cables. The LAPC1 is a PC card with the sound capabilities of a Roland MT-32 sound module. You can generally buy an MT-32 fairly cheaply second hand.

All you'd need then would be some decent MIDI software and you'd be set up nicely. Your interface could cost you anything from about £20, a decent suite of MIDI sequencing software can be had for under £100 (Try *MRS* from Doctor T) and the MT-32

shouldn't set you back more than £100.

To do it the way you'd planned would cost you over £1,000 in hardware and software and you'd be no better off.

I have an Amiga 500 with 1Mb and an extra drive. When I bought it (second hand) it came with a piece of software called *Audiomaster II* which is a sampler and player. There are a few demos on the disk and I am impressed enough to want to try sampling myself.

A friend has offered me the Trilogic Mk 2 stereo sampler and I want to know whether this will work with *Audiomaster*. I also want to know if I'm breaking the law taking samples from my CDs. My dad says I am (he's a stiff) but my mum says if I only do it for my own fun, no one will know and it doesn't matter.

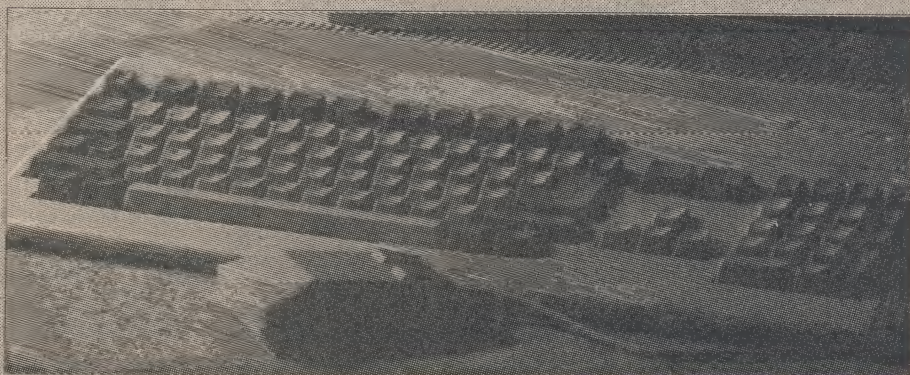
Mike Brough, Coventry

The Trilogic Sampler will work with your *Audiomaster* software. Incidentally there should also be some sampling software with the sampler. It's quite basic but it's good fun and an easy way to learn about sound manipulation. There's also a new version, *Audiomaster III*, which is everything that its predecessor was and more besides. If you want to get hold of a copy, give Silica Shop a ring on 081-309 1111.

To address your other question, sampling copyright material without permission from the copyright holder is theft. It's no different from any other theft. By sampling other peoples work you are potentially depriving them of the benefit (financial or otherwise) of their own work.

Having said that, I'm sure that everyone who has ever played with a sampler has fed something commercial into it if only to find out what Madonna sounds like singing backwards. But the real harm isn't done by somebody having an occasional giggle by manipulating a well known commercial sound, but by the kind of people who pass off other someone else's work as their own. If in doubt, don't...

If you are going to sample sound, why not try to be original and look for new sounds instead of borrowing other peoples. This isn't difficult. With a cheap (£20) microphone and a tape recorder, I went out to look for sounds and came back with some quite splendid noises. The best was a slapping bass guitar sound that was made by plucking the alternator belt of a 38 tonne Foden truck with a tyre iron before manipulating the frequency and content in a sampler. This may sound extreme, but it proves there are plenty of usable sounds available.



• And it looks like one too. The faithful Amiga 500, still going strong...



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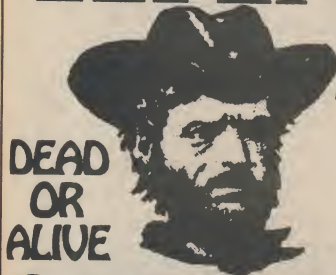
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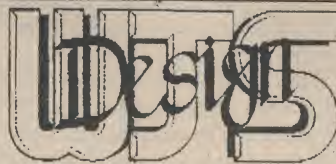


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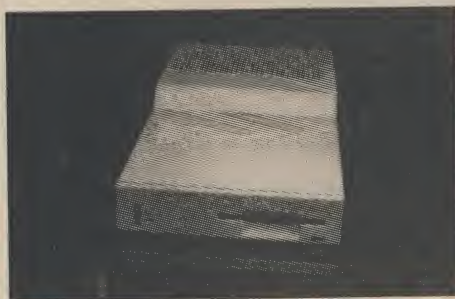
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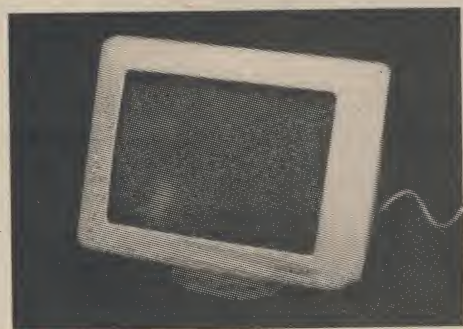
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• A small mono monitor that can be re-used.

truly IBM compatible there was a glut of 'almost' PCs on the market. These machines used the same operating system as an IBM but often had radically different hardware, disk drives and display controllers. An example of this is the Apricot F1 that lives in a corner of the Express office. Nowadays it's used mainly as a comms terminal but when it was new it was an innovative beast.

We've had several letters from people who have bought an Apricot F1, only to find that MS/DOS doesn't mean PC. To confuse matters even further, Apricot modified the specification of the F1 several times so there are several different versions going from vaguely to slightly PC compatible. The later versions can read and write PC disks so if it's just a data swapping job that you want to do, the F1 may very well be a cheap alternative to prepare data at home to take to the office PC.

The Express F1 is an early model so if we'd bought it thinking that it was a PC we'd have been disappointed. It runs MS DOS 2.1 (we're up to MS DOS 5.0

now) and the way that it handles display and disk formatting aren't PC compatible.

It's fine as a comms terminal and if we need to transfer anything to a PC we do it down the serial port. To find out what was inside it that was re-usable, we pulled it apart.

The keyboard of the F1 is a quirky thing that is infra red and sends the keystrokes to the F1 in much the same way as the remote control of your TV or video.



• The power supply. There is life in it yet.

Unless you're a hardware engineer intent on designing a new infra red joystick or mouse interface the keyboard can be consigned to the bin.

The monitor on the Express F1 is a nifty little 9 inch green screen monò jobbie and although its connector was a strange hybrid D shaped thing, a call to Apricot in Birmingham gleaned enough about the pin connections to organise a power supply and connect it to the composite output of an Amiga as a slave monitor during combining operations on a genlock.

INSIDE STORY

The lid of the F1 system unit came off to reveal a good stabilised power supply offering 12 and 7 volts in return for 240v mains. The disk drive was removed and again information from Apricot enabled us to find it a home as a spare drive for another machine. The F1 only had 256k of memory on board and removing this was the only really difficult job. It had been soldered directly to the board and the chips didn't want to part with their home. Had it been a machine surplus to requirement, the chips could have been removed without thought for the motherboard but we intended to carry on using it. This meant a touch like a midwife with the solder

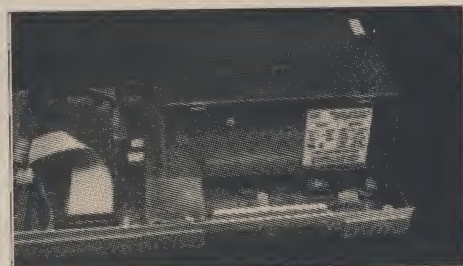


• Plenty of spare parts. A power supply and disk drive for starters.

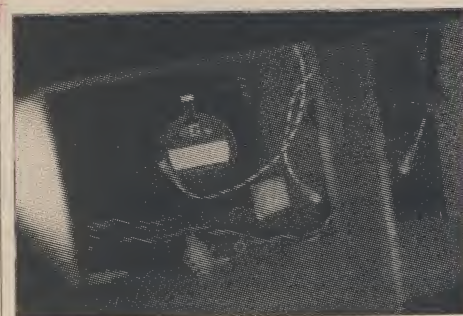
remover and a job that took the best part of two hours.

Hard disk drives and monitors are popular 'cheap buys'. If you buy a hard disk drive, remember that on its own it is useless. It has no controller card and the £20 you spend on your 20 Megabyte bargain can end up costing you as much in bits and pieces to make it work as a complete hard-card from a reputable dealer would have cost in the first place.

Displays are much the same too. If you buy a monitor that isn't specifically intended for your machine and it works, you are very lucky indeed. There are at least 20 different display standards and while some of these are slightly compatible, if you are going to buy a monitor, tell the vendor what you intend to use it with and obtain



• You will have to dig deep for the RAM chips. They are under this lot.



• Inside the hard drive box, there is a power supply and a fan.

confirmation that it will work with your machine. If you can't get that sort of guarantee and you buy a monitor that won't work with your system, you may find yourself the proud owner of a TV shaped white elephant.

POWER TO THE PEOPLE

At a recent computer show, people were scrambling over each other for the bargain £15 hard drives but they all ignored a chunky metal box designed to hold two, full sized 5.25 inch hard drives. The vendor was asking £4 for it so we fetched it back to the Express office. Inside was a stabilised power supply of gargantuan proportions with the normal 12 and 5 volt taps. And as a bonus, the cables inside the machine were ideal for some disk drive bodging envisaged in a later project.

Hiding in the back of the box was a 240v fan that looked as if it would power an airbus. Installed in a home made 386 it is doing sterling service keeping the PCs innards ambient. ■

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Clunk! A massive bag of disks drops onto the desk, quickly, before the creaking, straining desk gives way, they are slotted into the nearest Amiga.

The bundle comes from Dozsoft in Middlesex. Dozsoft has been pumping out PD stuff since the very earliest days of the Amiga 1000. It has no particular specialist field, but does a wide range of stuff, including the usual demos, a lot of games, and even more useful utilities and serious stuff.

Included in the bundle of Dozsoft stuff, was a disk utilities package, con-



• Racey pop foxtress Madonna indulges in a bit of Amiga hanky-panky.

THE PD COLUMN

This week, our PD patrolman Frank O'Connor puts Batman and Madonna in the same drive. And, as an added treat he harks back to some almost forgotten greats.

taining all of the usual tools. The package works well, and is reasonably simple to get to grips with. Also included was a very useful comms package.

Comms packages on the Amiga are never exactly interesting, but again this one is well executed, and performs its task in a reasonably efficient manner.

The one disk you should get hold of is the Predator's Megademo. Nothing to do with twisted alien space fiends, it does include a couple of absolutely outstanding games. Nothing fancy, but an excellent copy of the old Atari 2600 game, *Combat*. It almost brings a tear to the eye! More nostalgia in the form of a three player version of the *Tron* light-cycles game. Phwoar! more fun than a guy should have. Lots of music too, on this disk, some of it quite impressive.

Cartoon lovers will flip for a disk called *Puggs in Space*, a bit too cute for those of you with a nasty dispositions, but it has some beautiful animation, and goes on for quite some time.

Also worth a mention is the Crionics *Neverwhere* demo. Some fine music, some excellent 3-D routines, and some totally outstanding digitised pics of everyone's favourite sex bomb pop starlette Madonna.

ATARI

Atari owners might like to see one of the disks available from Public Sector PDL in Stevenage. Curious only in that it was written by the boys and girls from Atari, it is really an in store demo, publicising the peripherals available for the ST. Nice though, and a neat little thing to have in your collection.

If you are after something a little more serious, or perhaps a better term would be useful, then it should be noted that Public Sector does a nice line in practical PD. Just about every tool and utility you can think of, but special mention should be made of a select few. The standard GEM file selector on the ST is a bit duff to be perfectly honest, so the

really useful *Iconew* option, which changes all the stuffy old GEM icons into lovely interesting ones, makes a big difference in that department.

Stexscan is a great little program, which plots graphs of currency exchange rates, very useful for all you budding Gordon Gekkos out there. There is also a limited speech synth program which uses digitised increments of speech... realistic, but very, very odd.

Another goodie to watch out for on the ST scene is the *Batdance* demo, it contains bits of the Batman soundtrack, and can be fiddled with. Muck around with the samples, and read the scroll message, play it backwards, forwards, or speed it up... you could be just like the purple Prince!

Speaking of odd, this place gets more like the Twilight Zone every day. Just after that ranting monologue about spooky old computers, a little envelope appeared on the desk. Ripping open the envelope, the contents spilled out...

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***** THE LISTING BELOW IS FROM OUR LICENCEWARE PROGRAMS FOR WHICH THE AUTHORS RECEIVE A PERCENTAGE. THEY ARE ONLY AVAILABLE FROM US *****

- 705: AMIBASE PROFESSIONAL. (by Keith Grant), database prog. £2.00 (1 Meg Amibase Professional II coming soon, watch this space for details)
- 876: QUIZMASTER. Think you know it all? Well now you can prove it. Save and re-load facility. For 1 to 4 players. Excellent! £3.00
- 877: 1 ACROSS 2 DOWN. A fully fledged crossword program. It comes on two disks for only £5.00. Data disks 2 & 3 now ready at £2.00 each.
- Into coding? Want to learn? The Amiga Coders Club is for you! ACC 1-4 compressed issues of an excellent series for coders, even if you are new to the Amiga, get this if you want to learn Assembly, use Devpac etc. This introduction to the world of Assembly is only £1.50. The Amiga Coders Club disks are packed with source, hints, tips from many of the well known coders that are on the Amiga scene today. Issues 5, 6, 7, 8, 9, 10, 11 are now available. Please note: excluding the compressed introductory disk, Amiga Coders Club disks are £3.00 per issue.

***** HERE ARE SOME NEW GOODIES ***** SOME OF THESE ARE COPYRIGHTED TO AMIGANUTS *****

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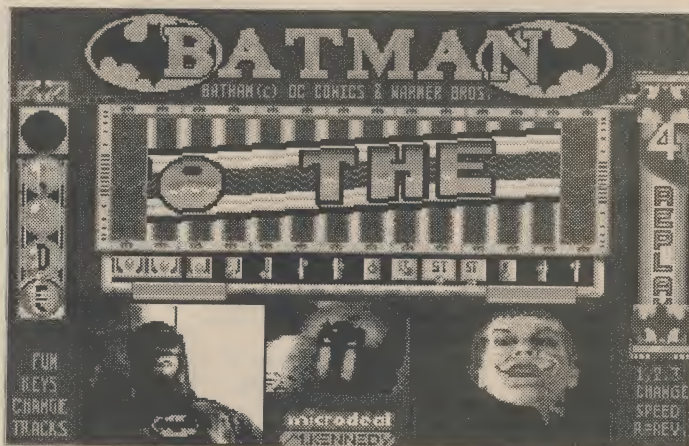
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• Batdance demo from PDL. D'ya ever dance with the devil under the pale moonlight? (no - Ed)

THE SPOOKY SAM COUPÉ SAGA!

Inside were Sam Coupé PD disks! Really, it's true. The stuff comes on 3.5 inch disks, from a Mr. G Middleton of Leeds, and includes a couple of movie demos. The first, is a video trailer thang, the subject of which is the science fiction Arnie romp, *Total Recall*, and the second, is a similar *RoboCop* demo.

The *RoboCop* demo has a memory sensing routine, and unfortunately will only run on 256k machines.

Still, if you have a Sam Coupé, you'd probably be very interested, so I have included details on how to contact Mr. Middleton at the end of the column. Hurrah!

GOLDEN OLDIES

This week, after a slow trickle of PD stuff, mostly scrolly German and Italian demos, a thought occurred; what happened to all those bizarre computers we used to know and love?

During the mid 80s, a positive rush of brand spanking new computer hardware hit the streets. Many young companies, with innovation and surprise on their minds, launched computers into the 8-bit sea. Some of which floated, while some sank without a trace.

It is these mysterious dinosaurs of computing, the lost relics if you like, which inhabit many a dusty corner throughout the land which are of interest

to us. Specific examples should include perhaps, the Oric, and Oric Atmos, two 8-bit wonders, the former remembered fondly for its built in sound effects, accessible from BASIC.

Does anyone remember the Enterprise? The matt black organic monstrosity with the built in joystick. How about the Tatum Einstein? Or maybe the best looking computer of all time, the Memotech? Other potentially great machines include the Coleco Adam, an upgrade for the Coleco console, and a brilliant machine in its own right.

Cast your mind back to the Sord M5? What a machine! More recently, we have the Sam Coupé, already beginning to slip into cult status and obscurity.

The question is, do these machines still have a user base? Are there hundreds of frustrated owners out there, desperately looking for software?

We all know from experience, and from common financial sense, that there is no commercial viability in producing software for these machines, but the public domain is little influenced by monetary matters, and enthusiasm counts for so much more.

So, maybe out there in the darkened alleyways and mean streets of PD land, programmers and enthusiasts are beaver away into the night, and discovering new tricks on their ancient, unloved machines.

If you know of such a group, or

WHERE TO GO

G.Middleton

G. Middleton sounds like a kindly chap, and if it's Sam Coupé stuff you are after, then he's your man. To get hold of him write to: G.Middleton, 35 Victoria Mount, Horsforth, Leeds LS18 4PU

Dozsoft

Dozsoft have been in the Amiga PD business for quite some time, and if you want to get in touch with them, write to: Dozsoft, 32 Benedict Drive, Bedford, Feltham, Middx TW14 8JL

Public Sector PDL

If the ST is your main machine then you really should be talking want to Public Sector PD. Drop them a line at: Public Sector PDL, 50 Ripon Road, Stevenage, Herts., SG1 4NA. Tel: 0438 364722 (ask for Michael).

have any thoughts on the matter, why not drop a line to the PD Column?

Who knows, before too long you could be pulling out your old computer from the more dangerous recesses of your attic, and then booting up something scrummy on that antique micro. ■

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EXPRESS ON-LINE

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NEW ARRIVALS ON-LINE

We would like to thank Keith Burton (sysop of Phantom) for his help in updating the listing this week. Whereas we always like to hear of new boards being set up, we also need to keep the list up to date. So if you know that any of the boards listed have now ceased to operate please write in and let us know.

Keith is also trying to compile a comprehensive list of Viewdata bulletin boards and would like any Viewdata BBS sysops to get in touch with him at: The UK Viewdata Directory, Phantom Comms, 56 Aldham House Lane, Wombwell, Barnsley, South Yorkshire S73 8RG.

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LEVEL 9 BBS Telephone 0926 889208. 10pm to 10 am, Amiga, Atari, ST and PC all supported. Sysop Steve Elliott. Speeds 300 to 2400 baud with MNP 4/5. Amiga based.

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061 PC Support 061-443 1529 V21/22/22b/23
4/ABC 0460 64511 V21
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Absolute Zero Q 081-741 7233 V21/22/22b/23
Advance Opus Hull 0482 28367 V21/22/22b/23
After Hours 0276 52096 V22/V22bis
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0268 780724 V22/22b.
Apricot Tech Sup 021-456 2402 V21/22/22b/23
021-456 2401 V21/22/22b
Arcade Fantasy 0533 376056 300-2400
Arcport 0252 737065 V21/23
Arena 0625 539063 V21/22/22b/23
Argus Project 091-490 0327 V21/22/22b/23
Arkham BBS 081-952 5128 V21/22/22b/23
Aspects 061-792 0260 V21/22/22b/23
ASTon-line 081-847 5389
Attic 081-308 0466 V22/22b
Auld Reekie 031-663 9924 V21/22/22b/23
Avalon Northeast 091-564 0009 V21/22/22b
Babble BBS 0532 785964 V21/22/22bis
Babbs Tower 0394 276306 V21/22/22b/23
Banat Board 081-783 1151 V21/22/22b/23
Barnabas 0708 852526 Hst
Barney's Rubble 021-441 1801 V21/22/22b/23
Basingstoke Opus 0256 728331 V21/22/22b/23
Bath BBS 0225 83584 1/840060
Bath BBS 0225 840060.
Bay BB 0227 741528 V22 Bis/MNP5
BBS09 0705 736025 Hst
BBZ 081-663 3732 V21/22/22b/23

Betelgeuse 5 0463 231339
Beyond Belief 0642 787898 V21/23
Bexhill Centre 0424 224417
V21/V22/V22bis/V23.
Big Bang Burger 081-420 6356 V21/22/22b/23
Bike Shop 0705 827764 V22/22b
Bibox 0634 200931 V21/22/22b
Blackpool College 0253 57941 V21/22/22b/23
Blindin' BBS 01 764-0954 V21/23
Blitter BBS 0292 671638 300-2400.
Body Matters 071-603 7581 V21/22/22b/23
Boog 0252 626233 V21/22/22b/23
Boroughbridge Q 0423 324532 V21/22/22b/23
Braindead Opus 0823 254352 V21/22/22b/23
Breakthrough 051-734 5817 V21/22/22b/23
Brown Bag 071-404 0897 V21/22/22b
Brunel BBS 0272 584352 V21/22/23
Budget BBS 021 311 1068 V21/V22/V22b
Buz Board 081-202 9175 V21/22/22b
Buzzy's Grapevine 041-762 2000 Hst
Byte Back! 081-959 8105 V23
Cargo BBS 0420 475462 V21/22/22bis
Campus Ros 0223 357445 V21/22/22b/23
Castle BBS 0276 691872 V21/22/22b/23
Cats Board 0628 824852 Hst
Catweazle 081-428 9476 V21/22/22b
Central BBS 021-711 1451 V21/22/22b/23
Chase Wildcat 0543 871562 V21/22/22b/23
Chequers 0622 891308 V21/23
Chiba City 0501 44262
Chipboard 0532 320225 V21/23/23v
Chronos' Lair 021-744 5561 V21/22/22b/23
The City BBS 021 352 1237 300-2400
CIX 081-399 5252 V21/22/22b/23
Clapham Junction 0234 64261 V21/22/22b/23
Cliff's Corner 0502 518274 V21/22/22b/23
Club 1512 081-204 8755 Hst
Co-op Board 081-316 6488 V21/22/22b/23
Co-op Board (crs) 061-832 1961 V21/22/22b/23
Co-op Board (nicc) 0509 826339 V21/22/22b/23
Co-op B'Mouth 0202 532701 V22/22b
Co-op P'Mouth 0705 754851 V21/23
Codeomatic BBS 0472 250690 V21/22/22b/23
Communitel Demo 081-968 7402 V23v
Compass!! 0942 896661
C'center Opus 071-928 2005 V21/22/22b
Computers 4 Christ 0926 428294 V21/22/22b/23
Connection 071-978 8540
Connections 081-903 1309 V21/23/23v
Connex 071-431 3922 Hst
Consett Forum 0207 506179 Hst
Corby Town Opus 0536 205113 V21/22/22b/23
Cornwall Gate Opus 0752 848806 V21/23
Cp/m User Group 0753 868196 V21/22/22b/23
Crown Green 071-245 1512 V21/22/22b/23
Crystal Junction 0384 441929 V21/V22/V22bis/HST
Crystal Tower 081-886 2813 V21/22/22b/23
Cure 0604 27865 Hst
Cv Database Bb 0427 810211 V22/22b
Cyberspace Amiga 0295 275045 V21/V22/V22bis
Cynotel 081-346 2816 V23v
DIE 061-434 9907 V21/22/22b/23
Dambusters 0203 333195 V21
Dark Crystal 081-207 2989 Hst
Dark Halo 0392 434477 Hst
Dark Side 0446 33729 V21
Darkhaven 0604 413716 V21/22/22b/23
Data Network 081-478 5464 V21/22/22b/23
Datasef/wanderland 081-680 5330 V23
Datasef Opus BBS 0460 54615 V21/22/22b/23
Datatrade Q 0536 725180 Hst
Dbase User Group 0532 842213 V21/22/22b
DCE Board 0296 88165 V21/22/22b
DCS 081-879 7578 V21/22/22b
Deep Thought 0634 683696 Hst/V32
Desert 0244 550332 V21/22/22b/23
Desert BBS 0604 758126 V21/22/22bis
Diamond Opus 0791 86504 Hst/V32
Diggertel #1 0925 411265 V21/22/22b/23

Digital Matrix 021-705 5187 V21/22/22b/23
Direct Access 0935 79760 up to 2400
Direct-line 1 081-841 1847 V21/22/22b/23
Direct-line 2 081-842 2030 V21/22/22b
The Dock 091 454 6978 300 to 2400
Domain BBS 081-773 2422 V22/22b
Dragon's Tower 081-202 0709 V21/22/22b
Dunedin Blackhole 031-669 2974
Dwarfen Realm 0376 501036 V23v
Eddie's BBS 0635 71324 V21/22/22b/23
Edinburgh Castle 031 334 7043 HST
Empire BBS 0473 683215 V21/V22/V22bis
Empirical Research 0543675158 V21/22/22b/23
Empyryon 0792 580781 V21/22/22b/23
End To End 0376 84644 V21/22/22b/23
End Zone 0524 752245 V21/22/22b/23
Engineers Workbench 051-327 7036 V21/22/22b
Equaliser 0232 454097 V21/V22b/V23
Eureka II 081-683 0629 V21/22/22b/23
Exchange S/w 0767 5051 V21/22/22b/23
Eye-2 0525 715789 V21/22/22b/23
Fal Opus 0736 794827 V21/23
Falcon BBS 081-527 4165 V21/22/22b/23
Family Skeletons 0480 812097 V22b
Fido Uk1 0734 713909 V22/22b
Flight Path 081-759 1957 V22/22b
Focus International 0905 795002
Focus Tbbs 0303 42690 Hst
Focus Uk 0905 774477 V21/22/22b/23
Forth View 031 660 6680 V21/22/22b/23
Forum-80 Hull 0482 859169 V21
Foundation 0473 688183 12/2400
Fox's Den 0689 27085 V21/22/22b/23
Free Net One 0767 51972 V21/22/22b/23
Freelance Lynx 0480 406261 V21/22/22b/23
Friday The 13th 0642 224833 V21/22/22b/23
Fuzzy Logic 0634 200707 V21/22/22b
Gabbos 0705 524805 V21/22/22b/23
Gallery Qbbs 081-847 2795 V21/22/22b
Game Over 0752 848070 V21/22/22b/23
Games Online 0273 699200
Gaslamp 0706 358331 V21/22/22b/23
Gaugonzola BBS 0453 511112 V21/22/22b
Ger's Lair 071 436 5749 300-2400
Gnome At Home 081-888 8894 V23v
Gods 081-994 9119 V21/23
Golly! 0734 320812 V21/22/22b/23
Goobtel 0602 706307 V21/23
Good Life 081-541 0187 Hst
Gopherit's Box 061-320-3208 V21/22/23
Gourmet 0474 536654 V21/22/22b
Grainstore 0905 770198 V21/22/22b
Grenadier 0825 762803 V21/22/22b
Hacker's Delight 0702 523853 V21/22/22b
Halfwits BBS 0272 340310 V22/22b
Hamnet 0482 465150 V21
Harlequin 061-945 3612 V21/22/22b/23
Hastings BBS 0424 717919 V21/22/22b/23
Hawk's Castle 0344 411621 Hst
Hazzard Bb 071-737 0505 V21/22/22b/23
Health-data 081-986 4360 V23v
Heartbeat 0734 352032
Hilary's Board 0277 233468 V21/23
Hot-air Opus 0579 70347 V21/22/22b
Humber Bridge 0482 850785 V21/22/23
Ichthus (trinity 3) 0734 461466 V21/22/22b/23
0903 700771 V21/22/22b/23
Index Linked 0227 770403 V21/22/22b
Industrial Archaeologists Diggings BBS 0517 331135 300 to 2400
Infocomm UK 0895 72021 V21/V22/V22
Islington BBS 071-704 0760 Hst
071-226 1248 V21/22/22b/23
Jersey BBS 0534 37779 V21/22/22b/23
Jersey Opus 0534 39389 V21/22/22b/23
Jocks Away! 031-225 5368 V21/22/22b/23
Jolly Fisherman 0754 67796 V21/22/22b/23
Jolly Roger 081-742 1640 V21/22/22b/23
Jusavo 0324 32414 V21/23
Just The Place 0705 258694 Hst
K-wood 0608 83458 Hst
Kashmir's BBS 0472 347882 V21/22/22b/23
Kernow Bb 0209 821670 V21/22/22b/23
Key-board 0908 668398 Hst
Kidlington BBS 0865 56703 V21/22/22b

Kirklees Opus	0484 665415	V21/22/22b/23	Murky Caverns	081-426 9386	Hst	Publishing Shop	091-261 5228	V21/22/22b/23	Sputnik Spitfire	0501 31754	V21/22/22b
King Of The Castle			Mwcfce	0926 421844	V22bis	Purely Pc	0232 645942	V21/22/22b	St London BBS	081-443 2432	V21/23
	0233 620228	V21/22/23	My Little Phoney	0865 773277	V32/HST	Pyramid	071-239 0871	V21/22/22b	Stabb	0793 855176	V21/22/23/22b
Komputer Knidge	0844 274066	V21/22/22b/23	Network 23	0274 482021	V23v	Pyro Mountain	0895 59071	V21/22/22b	Staines BBS	0784 465794	V21/22/22b/23
Kybernesis	081-673 7294	V21/22/22b/23	Nicc Mid-west	0341 250377	V21/22/23	Quasar	0846 693067	V21/22/22b	Starbase One	071-733 3992	V21/22/22b/23
Labyrinth	051-724 4458	V21/23	Nighthawk	0329 45384	300-2400	Really Interesting	0582 414991		Steve and Jackie	0703 650037	
Lamplight Qbbs	0705 811531	V21/22/22b/23	Nite Life	071-976 6807	V21/22/22b	Reflex BBS	0703 685527	V21/22/22b/23			V21/V22/V22b/V23
Laser Tbbs	0532 438430	V21/22/22b	No Escort Required			Regency BBS	0542 33050	V21/22/23	Strange Brew!	081-665 5038	V22/22b
Lau's Ql Bb	081-751 6096	V23v		081-200 3817	Hst	Remotelc/w	0555 851887	V21/22/22b/23	Stun User Network		
Lightfinger's Place			No.1 BBS	081-958 1689	V21/22/22b	Rivendell	0602 640488	V21/22/22b/23		061-429 9803	V21/22/22b/23
	0202 485723	V21/22/22b/23	Noah BBS	0272 572322	300-2400	Rm Tech. Support			Summer Wine	0484 653234	Hst
Linelight	0580 212043	V23v	Norpac	0434 608324	V21/22/22b		0865 796431	V21/22/22b/23	Sunburn Inc.	021-449 5269	V21/23
Linx BBS	0522 511277	V21/22/22b/23	North Wales BBS	0978 88372	V21/22/22b	Road Runner	061-483 4105	V21/22/22b/23	Super Ops BBS	0782 284081	V21/22/22b
Liquorice Allsorts	0633 279985		North Yorks Q	0423 868065	V22/22b	Roayalink Uk	0962 66807	V21/22/22b	System-c-v	0403 50607	Hst
Liverpool Mailbox	051-428 8924	V21/22/22b/23	Northern Lights	0768 773685	V22/22b	SAC BBS	0242 260685	V21/22/23/22b	TABBS	0533 517615	V21/22/23
Liverpool Ros	051-931 4271	V21/22/23	Norwich Onion BBS			Sas BBS	0742 325232	V21/22/22b/23	Tabbs	0225 743797	V21/22/22b/23
Loch lomond	0389 55762	V22v/V22bis		0603 423305	V21/22/22b/23	Satellite Southwest			Taecommm	0994 6709	V21/23
Loft	0442 230461	V21/22/22b/23	Nova	0455 553371	V21/22/22b		0392 53116	V21/22/22b/23	Taff's Retreat	0834 4562	V21/22/22b/23
Logical BBS	0772 623167	300-2400	Nova-net	0274 370760	V22	Scabbs	0909 479080	up to 2400	Tardis	0772 27236	V21
Log On In Tynedale			Odd-ball	081-679 2583	V21/22/22b/23	Scary Monster	0734 320297	Hst	Tasque	0355 222664	Hst
	0434 606639	V21/22/22b/23	On The Beach	0273 600996		Scot Air	0505 360396	V21/22/22b/23	Tasug Opus	0904 760129	V21/22/22b/23
London BBS	081-455 6607	V21/22/22b/23			V21/V22/V22bis/HST	Scotthelp-St	031-343 6368	V21/22/22b/23	Tavern	081-445 6514	V21/22/22b/23
London City Mag	081-468 7648	V21/23/23v	Open Access	081-427 3974		Scottish Opus	041-880 7863	V21/22/22b/23	Tbbs-rovoreed	081-542 9767	V21/22/22b/23
London Connexion			Optix	0482 872294	V21/22/22b/23	Scottish Wildcat	0674 671141	V21/22/22b/23	Tequila Sunset	0703 867786	V23v
	081-667 1313	V21/22/22b/23	Organic Garden	081-464 3305	V21/22/22b/23	SCS One	0444 236002	V22b	Terminal Net 5	0402 456135	V21/22/22b/23
London Embassy	081-366 1778	Hst	Out Of The Blue	081-668 7667	V21/22/23	Sector	0772 454328	V23v	Terminal-net	081-423 5262	V21/22/22b/23
London Guest Hse			Owl Service	0532 605876	V21/23	Semaj Qbbs	0303 862415	V22/22b	Tharr BBS	0234 261804	V22/22b
	081-748 0974	Hst/V32	P'S & Q'S	051-236 3105	V21/22/22b/23	Sentinel Bb	0628 781429	V21/22/22b/23	Tharr Wave	071-585 3163	V21/23
London Mail Centre			Pacific Lightning	0732 845338	V22/22b	SES Databoard	0622 630240	V21/V22/V22bis	Three Kings	0354 56267	V21/22/22b
	081-534 1200	V21/22/22b/23	Packet BBS	081-547 1479	V21/22/2	Shades	0342 810905	V23	Track 83	0953 851351	V21/22/22b/23
London Metropolis			Packet Place	0484 435620	V21/22/22b	Shadowfax	0252 528146	V21/22/23	Transylvania	0274 621668	
	081-519 1055	V21/22/22b/23	Palm Beach	0303 265979	V21/22/22b/23	Shadowland	081-897 0488	V21/23	Tranz-com BBS	081-952 6273	V21/23
Loony Bin	0703 787489	V21/23	Pazaz Viewdata	0383 620259	V23v	Shasby's Lair	0772 561066	Hst	Trinity I	0392 410210	V21/22/22b/23
Mabbs	021-444 8972	V21/22/22b/23	PC Access	071-608 0081	V21/22/22b/23	Sherwood Forest	0602 397113	V21/22/22b/23	Trinity II	0367 22764	V21/22/22b/23
Mach II BBS	0242 260 685	V21/22/22bis	PC-Amiga Link	04023 84914	up to 2400	Short Circuit	0273 462967	Hst	Tug II	0905 775191	V21/22/22b/23
Mactel Hq (grn Box)			PC Forum	0322 335348	V21/22/22b/23	Sid (acorn Service)			Twilight Zone	081-788 0884	V21/22/22b/23
	0602 455444	V21/22/22b/23	PC Serve Shop	081-864 2633	V21/22/22b/23		0223 243642	V23v	Twilight Zone II	071-608 1485	Hst
Mactel Metro	081-543 8017	V21/22/22b/23	PC Serve Softnet	0895 420164	V21/22/22b/23	Sigma Four	081 330 7738		Uk Healthlink	0942 722984	V21/22/22b/23
Mactel Phoenix	0473 610139	V21/22/22b/23	PC Serve Storehouse			Signal Box	081-337 6583	V21/22/22b/23	Unisys Etoi BBS	081-453 5739	V21/22/22b/23
Madness BBS	0603 300947	V21/22/22b/23		0494 728094	V21/22/22b/23	Sin Bin	0532 661536	V23	Unit One	0285 713688	V21/22/22b
Magic Castle BBS021-430 3761		V21/22/22b/23	PC-VAX Opus	081-800-3549	V21/22/22b/23	Sirius	081-542 3772	V21/22/22b/23	VITAS	021-749 5860	V21/23
Magic Mushroom	0361 83641	V21/22/22b	Pcamiga BBS	0602 735119	V22/22b	Sirius II	0494 778425	V21/22/22b	Valente'S BBS	071-978 2078	Hst
Magnum	0274 547006	V21/22/22b/23	Peacenet West	0895 448998	V23v	Six And Five Eights			Vector System	0329 45824	Hst
Magrathea	0376 24402	V23v	Pecan Software	0272 248076	V21/22/22b		0273 688888	V22/V22bis	Viking East Anglia	0255 503048	V23v
Manor	0980 863031	V21/22/22b/23	Penguin	0943 830820	V21/22/22b/23	Skull	0379 740972	V22/V22bis	Village	081-464 2516	V21/22/22b/23
Marcel	081-346 7150	V21/23/23v	Phantom	0226 340425	V21v/V22v/23	Skull's Tower	081-943 1194	V21/22/22b/23	Village Fayre	081-841 5971	V23
Matrix	051-255 0225	V21/22/22b/23	Phoenix	0249 817704	Hst	Sky-line	0603 742273	V21/23/23v	Voyager BBS	061-725 9580	V21/22/22b/23
Max BBS	V21/V22/V22bis/V24/V32/V42/V42bis/9600/14K4/MNP and LAPM. Numbers as follow:		Piston Popper	0242 853361		Skyline 1	0234 741691	Hst	West Norfolk	0553 761290	1200/2400
	0905 52536	Alien Node	Plug-ole	021-472 0256	V21/22/22b/23	Softmatic BBS	0733 322540	V21/22/22	White Lightning	0635 37259	V22/22b
	0905 57822	We've Got A Hot One Here	Plus And Minus	0559 322766	V21/22/22b/23	Software Source	0892 661149	V22/22b	Whitehall Pent	071-930 3903	V21/22/22b/23
	0905 58030	Throbnnet Node	Poacher	0476 62450	V21/22/22b/23	Sorcerer's Dungeon			Wild Imaginings	091-263 4303	V21/22/22b/23
	0905 56610	So You Like Spam Node	Polynet Bb	071-580 1690	V21/22/22b/23		0636 815705		Winchester Remote		
	0905 57112	Dirty Lines Node	Port Of Call	081-391 5779	V21/22/22b/23	Sounds Of Mercia	0203 682896	V21/22/22b		0962 69322	V21/22/22b/23
	0905 56335	Amiga Node	Power Play Q	0698 423669	V21/22/22b/23	South Lincs BBS	0780 63954		Wolverhampton ROS		
	0905 58042	Troffers Node	Power Tower	0533 880114	V21/22/22b/23	Sparx	0793 480287	V21/22/22b/23		0902 745337	V21/22/22b/23
	0905 754151	For All Software Troffers	Prestonet	0772 612462	V23v	Pook BBS	0268 767365	V21/22/22b/23	Womble Base	081-979 9606	V23
	0905 754127	Live and Kicking Down Raid	Project BBS	0384 401770	V21/22/22b/23	Sphere BBS	0294 221350	V21/22/23/22b	Woodgreen BBS	081-889 5624	V21/23
Mbbs Leconfield	0964 550745	V21/22/22b/23	Prometheus	081-300 7177	V23v	Spuds Xanadu	0203 695266		Yugo BBS	0734 753648	V21/22/22b/23
			Proximity	0793 480028	V21/22/22b/23			V21/V22, V23, V23b	Zeus BBS	0487 710487	V21/22

Get yourself listed!

If you run a user group or bulletin board, don't miss out on this essential service – fill in this form for a free entry and send it to Express On-line, 30 Monmouth Street, Bath BA1 2BW.

Name of group/BBS (Delete as applicable)
Address:

- Write your ad in block capitals on the grid below using one letter per block. It will appear in full for the first week then the relevant details will be printed in the main listing after that. Information for bulletin boards should include details of baud rates, times on-line and the machines they are for as well as the telephone number.
- Also, please let us know if any of the information is out of date

Tim Smith's

Write to 30 Monmouth Street, Bath BA1 2BW
(The interleaves are on the trees)

CENTREFOLD

OPENING TIME



VAT rises. It's only just dawned on many people that VAT has gone up by 120 per cent. This is, of course, if you take into consideration the year on year, cross indexed, price ratio calculation which came free with Normo Labbatt's copy of *Mini Office Professional*.

What will this mean to computers and computer users? Well, because we've all had to give up going to the pub and the cinema because a pint of wallop costs £4.50, and a ticket to the flicks will set you back £120, it appears that the only reasonable pastime is staying at home with your favourite computer or, dare I say it, console.

Politics eh? It tells you something about that particular field of endeavour when the only two games ever to be released for it were *Yes Prime Minister* and *Yes Chancellor*. Have fun!

JUST WHAT ON EARTH DO THESE COMPUTER GAMES THINK THEY ARE ANYWAY?

PRINCE OF PERSIA

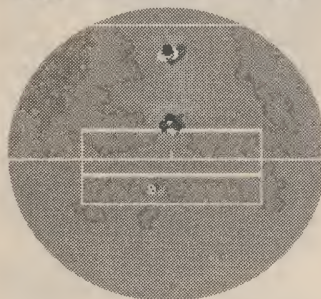


Prince of Persia is one of those games which makes you sit back and say: "Good Lord James of Adrossan and the Islands but this is pretty impressive stuff for a computer. I remember back in the 30s when there were no such things as computers or games, let alone Persia. We owned Persia back then I think ... we owned most things didn't we? Anyway the best point about this game is the way the little fellow in the jim-jams toddles about the place. He's after a woman you know, I remember women although I don't think that jim-jams will impress the wench.

TIP: Lose the pyjamas.

The first in an occasional series which aims to bring a fresh look at games. This week, Matt Crapper (78)

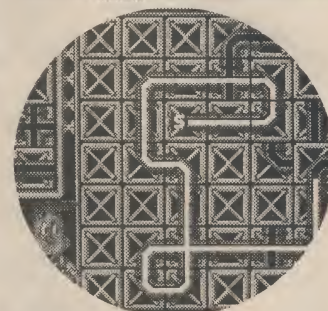
KICK OFF II



Kick Off II. I remember seeing the Matthews Cup Final in '51, or was it '54 or '57? The players weren't as small as this lot and the shorts were longer. It seems like a good game to me although I would like to see the winning team cheering the losers off at the end. It's only right and proper isn't it?

TIP: Make your shorts longer and cheer the losers.

PIPE MANIA



Now this one foxed me and the ghost of the missus quite a bit. My pipes are nothing like this at all. I have a selection of some 12,000 pipes and as far as my banana, sorry memory, tells me none of them have ever been full of nasty fluid. In fact that fluid is quite like the stuff that Spiffy Montague made as soup during Suez. Disgusting, I don't think that this kind of thing should be allowed. What's wrong with Campbell's Pea and Pilchard soup anyway? So, the point of this game appears to be to stop your pipe filling up with Squiffy Montague's concoction.

TIP: Always use Wade's pipe cleaners.

TEN THINGS YOU NEVER KNEW ABOUT EXPRESS

1) Andy Storer once programmed for the SAS and CIA. He left because: "I was looking for a challenge"

2) David Golder thinks he is working for the *Daily Express*.

3) The *Express* office consists of five areas: News room (12 x

12), Art/Production Area (12 x 12), Features zone (12 x 12), Editor's suite (13 x 14), and Keith's Fetteling Parlour/Old Computer Sanctuary (46 x 78).

4) Julie Tolley's favourite way to spend the weekend is at the All Format's Show or Sinclair User Group meetings.

5) Keith once managed to save a 747 by fetteling a CPC 6128 to the automatic pilot

6) Haydn Fitz-Williams is 5,00,282nd in line for the throne.

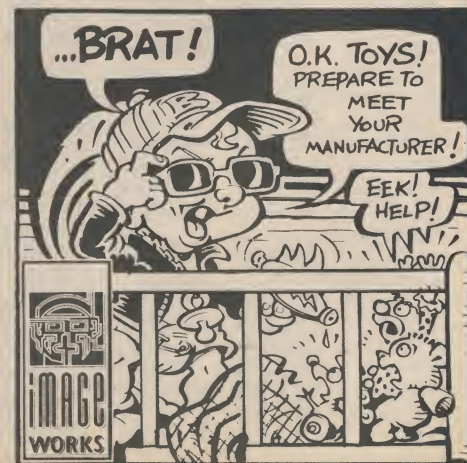
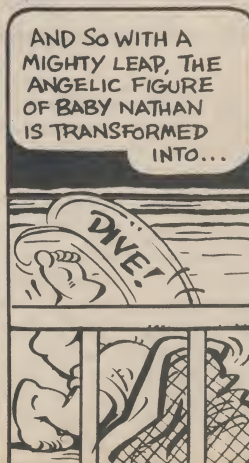
7) Amanda Cook keeps an Magnum 357 by her desk: "Because you never know when

someone might try to plant a virus on your Mac"

8) NCE is an anagram of CEN, a word meaning 'of great joy and charisma' in virtual Croation.

9) Er....

10) That's it.



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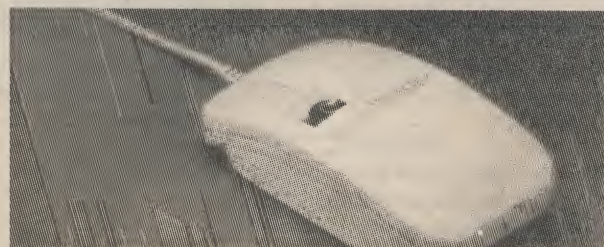
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First let us consider control in terms of C. The simplest form of conditional statement is: `if expression statement1`. When an alternative action is possible, this becomes: `if expression statement1 else statement2`.

You can use another conditional statement as the expression to test, or the statement to obey, which results in nested conditionals. These can seem ambiguous, but if there's any doubt, an 'else' statement is attached to the most recent 'if' expression. So:

```
if (x <= 0) if (x < 0) printf("Negative
number"); else printf("Zero");
should be read as:
if (x <= 0)
{ if (x < 0) printf("Negative number");
else printf("Zero");
}
```

rather than:

```
if (x <= 0)
{ if (x < 0) printf("Negative number");
} else printf("Zero");
```

The latter interpretation would tag every number above zero as zero, which is clearly not what we want.

A terser version of this does away with the keywords. To distinguish negative and positive integers, ignoring zero, the expression would be:

```
x < 0 ? printf("Negative number") :
printf("Positive number");
```

This form of the conditional is most useful inside another statement. If you want to add the larger of a pair of numbers to a total, you could use:

```
total = (a < b ? total + b : total + a);
```

rather than:

```
if (a < b) total += b; else total += a;
```

The more complicated the expression, the more you save by not duplicating commands.

A case statement is provided by the switch statement, which has the form:

```
switch (letter)
{ case 'W': case 'w': printf("White
Rabbit\n"); break;
case 'M': case 'm': printf("Mad
Hatter\n"); break;
default: printf("I do not know that char-
acter\n"); break;
}
```

The variable `letter` holds the value given to the switch statement. Each case statement selects the action to be taken and the default statement provides a useful catch-all condition. You need 'break' after each of the case selectors so the machine will exit after the required command or the other commands will also be executed.

LOOPS

C has three loops: the 'while', the 'do' and the 'for' loops. The 'while' loop tests the loop condition before executing the body of the loop, the 'do' loop tests it at the end and the 'for' loop carries out the loop body as many times as the control statement directs. This is a more complicated than in other languages:

```
for (expression1; expression2; expression3)
statement
```

Expression1 is evaluated before the loop is entered and is often used to initialise the control variable, expression2 is the control statement, giving the bounded limit of the control variable, and expression3 is usually used to update the control variable, as it is executed with the statement as the loop body. To print the integers from one to ten, incrementing the control variable by one and printing its value, this 'for' loop could be used:

```
main()
{ int i;
for (i=1; i<11; i+=1)
printf("%d\n", i);
}
```

A loop can terminate from the middle of the loop body

C SERIES: PART TWO

In the second part of an introduction to the C programming language Mary Branscombe explains loops, arrays, structures and functions ...

using a conditional statement which results in the break statement.

ARRAYS

An array is a set of data in the form of a table and this is declared simply enough. For example:

```
int a[100]
```

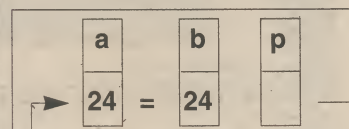
gives you an array of integers, indexed from zero to one hundred. The dimensions of an array must be specified as numbers or constants defined at the beginning of the program, as in:

```
#define LENGTH 100
```

LENGTH can be used throughout the program for one hundred. Variables cannot be used for the dimensions of an array because the value of a variable can change, but the size of an array cannot. If you want an array whose dimensions can vary during the program's execution, you need C++, which we will look at next. A multi-dimensional array is given two indices:

```
table [i] [j]
```

To step through an array, an incremental 'for' loop is typically used, increasing the value of the index variable each time round the loop. Evaluating the name of an array gives you its address in memory. To find the *n*th element of an array, we look *n* bytes further on in



```
p = &a;
b = *p
```

memory than the address of the start of the array. This means that the only information about the array that you need to pass around the program is the name, which simplifies matters enormously. Any variable that returns the address of any object is called a pointer, because it points to the object.

If we say `p = &a`; then `p` points to the address of variable `a`. We can then assign the value that `p` points to, which is the value of `a`, to another variable `b`. This is `b = *p`; the asterisk says "retrieve the value at the address that `p` points to." This is indirection and these two mechanisms give us a powerful way to pass values around a program. If we pass only the value of a variable, we cannot change the variable's value; to do that we need the address, as given by the pointer.

STRUCTURES

To store data in something more structured than an array, C provides the singly- and doubly-linked lists that we have seen before. Any other structure you want can

be defined as an object of type `struct`, which is like a record in Pascal, or a filing card in a card index, and this is an important feature for object-oriented programming.

A `struct` can be as complex and complicated as you need, but the basic form should be:

```
struct structure_name
{ type1 member1;
type2 member2;
type3 member3, member4;
};
```

To store the code number, name, weight and length of an object, we can define the `struct` object:

```
struct object
{ int code;
char name[20];
float weight, length;
};
```

We can now declare variables of type `struct` to store specific objects:

```
struct object object_one, object_two;
Members can be assigned to a variable of type object:
object_one.code = 11;
strcpy(object_one.name, "Pencil");
object_one.weight = 11.8;
object_one.length = 12.1;
```

Both structures and the addresses of structures can be passed as arguments to functions. Passing the address is more efficient, as no copy is made of the structure, but passing the structure makes it easier to access the members of that structure.

FUNCTIONS

A function takes the form:

```
function_name(type1, parameter1 ... typen,
parametern)
{declare any variables;
body of function;
return(variable_name)
}
```

If the function returns the value of a variable, this variable must be noted in `return(variable_name)`, which makes the program jump back to where the function was called. A function should be declared with its parameters at the beginning of the main function, so that the compiler can type check as soon as the function is called, rather than when the compiler reaches the code for the called function. A function can be declared and used inside another function or it can be declared at the top level and used throughout the program. ■

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FROM A TO B VIA Z

A suite of route planning software for the Amiga or PC at under £20. It looked too good to miss. Unfortunately it wasn't ...

When Yorkshire based Geographic advertised its *Door To Door* route planning software for the PC and Amiga, the sub £20 price tag made it look like a bargain.

We telephoned the number to ask for a sample to review, but always got the engaged tone or an incoherent answering machine. Eventually we managed to get through to a chap who identified himself as John Gold. He promised review copies and sung the praises of what he described as an innovative and exciting product. He talked of plans of integration of digitised maps allowing you to plan any route literally from door to door.

After this glowing description, we could hardly wait to see the product ... but in the event, we had to. And wait we did. A couple of weeks passed and it was impossible to get through to Geographic. *Express's* advertising department was told about the delays with the review samples and decided to put Geographic on hold for a couple of weeks while we checked the product. And a good thing too.

In our conversation with John Gold, he had made reference to his team of programmers whose leader was no less than a doctor "You mustn't bother the good doctor who's much too busy," he said. Still needs must and we asked him how we could contact his team. "That's classified information and I can't tell you," he said. We'd been promised the review sample so we decided to wait ... and wait ... and wait.

THE PREY

As no review sample was forthcoming, we contacted a couple of *Express* stringers who had bought the product and borrowed a PC and an Amiga version of *Door To Door*. Both readers were disgusted and told us not to bother returning it as they weren't impressed.

THE REVIEW

Door To Door arrived in an envelope that had a disclaimer and licence that would have done justice to an American multi-national software company. In short, before you can get at the product or its scanty documentation, you have to break a seal that consigns your rights to the bin.

Once the seal is broken, you are on your own. First out of the bag was the PC version. It was supplied on a 3.5-inch generic disk with a tatty typed label that said *Door To Door*. We placed it in the drive of a portable in the office and ran the program. The screen stared blankly at us for a couple of minutes and just as we thought it had given up, the following text message appeared on the screen

FIND A ROUTE ? Y/N

On typing Y the screen changed to an initialisation procedure that lasted what seemed as long as *Gone with the Wind* and changed to:

TYPE START TOWN (Q to QUIT)

We chose Chorley, a reasonably sized market town in Lancashire and Geographic tartly informed us that Chorley was not available. Not to be deterred we decided to ask a policeman directions from Chorley to Wigan and start from there. Wigan was included so we were able at least to start our journey.

The destination was Peterborough and the Nene Valley Railway. The trip from industrial Lancashire to the flatlands of the fens runs diagonally across country from the North West to the South East.

We hit the return key and waited. Waiting seems to have been the most prevalent feature in the whole Geographic saga. While we waited for it to calculate the journey, we nipped off to do a degree course, cook a 12 course chinese meal and paint the Forth Road Bridge. When we returned, it had nearly finished working out a route. Joking apart, there was a wait of a good five minutes before *Door To Door* offered its route

The route that it offered had us leaving Wigan to travel south on the M6 to the M62, crossing the Pennines in a north easterly direction then heading south along the A1.

A quick look at the map suggested four alternatives that would take less time and miles and a quick chat with the Greater Manchester Constabulary which patrols the highways and byways around Wigan confirmed that the A58/M61/M62 or A58/A579/A5082/A580/M62 routes would be quicker and more appropriate. An alternative route via Manchester and Sheffield was chosen by a local coach company with wide experience of the area and the route shown in Geographic was widely held as a nonsense.

Any program can have a glitch, so we picked another route in another area. Swindon to Stroud is a direct route North West on the A419 trunk road. Geographic agreed that the A419 was the road to use, but instead had us leave Swindon and travel South to the M4. The long trek West on the M4 took us to Almondsbury, west of Bristol, where we joined the M5 to travel North to Junction 13. Here we rejoined the A419 to arrive in Stroud from the West!

To avoid waiting a decade for any sort of result from the program, we installed it on a Goldstar 386 on test in the office. This powerful PC managed to pull *Door To Door's* socks up enough that we didn't need to wait too long to view the next silly route.

The Amiga version, if anything, was worse. Slower, more quirky and more difficult to use. When we eventually persuaded it to provide us a route, the route was as bad and as silly as the PC routes. Installing it on a hard drive speeded things up, but not by any great shakes.

WHERE'S MY PROGRAM?

Normally a review is confined to the product and its features, but on this occasion there has been more said about the company than *Door To Door*. Those who have received the product and written to *Express* have complained that the product is seriously flawed. Several other potential purchasers have written to complain that their program hasn't arrived even though the cheques have been cashed. Many readers have complained that Geographic has changed its telephone number without informing anyone.

Second down the list of complaints is that the product does not match its description. When advertised, digital maps were promised. No one received them.

Extra add on modules were planned, but we have not had sight or sound of those either. *Door To Door* was sold as a business package capable of organising inner city street directions. Again, in this it is seriously flawed.

Graphics, animation and sound were planned. We got text only. Those who did not receive the product are in some ways better off than those that did. At least they don't know what a let down it is.

OPINION

Door To Door is rubbish. The company which produces it is at best naively optimistic and at worst, dangerously incompetent. The cash channelled through its accounts should be returned to the buyers who have been offered a program that is sub standard for even a PD library. It isn't worth 20 pence, never mind 20 pounds. If you have sent off for *Door To Door*, stop the cheque. If it has been cashed and you have not received your goods, report the company to your local trading standards officer and police force.

Express has stopped Geographic from advertising its wares in any of our group publications, and thankfully other publishing houses have followed our lead. A full investigation of Geographic is underway and we will publish a full report when full facts are available. ■

IT'S A LONG LONG WAY ...

```

Route from SWINDON To STROUD
*****
From SWINDON
Take the A4259
Take the A419/JN15(M4)
TAKE THE M4
At JN15/M5
TAKE THE M5
At JN13(M5)
Take the A419
To STROUD
*****
  
```



• The disappointing text only display of *Door To Door*

• The fastest way between two points is a straight line !!!!!

• F-19 Stealth Fighter was a major success for Microprose. F-15 Strike Eagle shares the same team of programmers.



Now that Saddam Hussein has finished his winter offensive, Microprose is about to start its spring one, with the launch of its **F-15 Strike Eagle II**. First seen on the PC-compatibles, way back in 1989, this vector flight-simulation is now destined for the 16-bit market

The job of converting from PC to Amiga and ST falls to the same team that handled **F-19 Stealth Fighter**, so Microprose is hopeful that F-15 will be as successful as its earlier counterpart. F-19's vector-engine provides the basic 'core' of the new program, but with significant re-development and enhancements. **F-15 Strike Eagle II** comes complete with a more modern a realistic HUD and flight control panel, graduated horizons, improved frontend sequences and better colours. Sound effects, music and sampled sound are all also in the process of being upgraded.

Differences in gameplay (when compared to the PC version) include the addition of missions to destroy ground targets, convoys and the option to choose the

amount of weapons you take. There's also a huge playing area, encompassing places like Libya, the Persian Gulf, Vietnam and the Middle East (which all appeared on the PC) plus Central Europe and the Northern Cape (which were developed as part of F-19). Released dates are expected to be May for the Amiga and June or July for the ST. Both will be on sale at £29.99.

Meanwhile, in a dark corner of Sicily, moves are afoot to make Mafia history – the Family are at last to make an appearance on home computer! US Gold has secured the licence to **The Godfather Part III**, Francis Ford Coppola's latest film centred on the life of the Corleone Family. This is the third and final part of the trilogy of films, based on Mario Puzo's award-winning novel, which details the rise and fall of an immigrant Italian lad (Vito Corleone) who makes a name for himself in the

GAMES WEEK

Neil Jackson gives you his final low-down on the latest new games, playing tips, cheats and news.



extortion and protection business. 'Don' Corleone eventually gives way to Michael Corleone, his son, who in turn takes over the reins of the Family business.

Part III is concerned with Don Michael's desires to turn the business into a legitimate operation, by investing heavily in the church. In the process, much dirty work is done by Vincent Mancini, son of Michael's elder (and dead) brother. All gripping stuff, with the usual climatic ending, but Games Week wonders how this is all going to work on computer!

The job of turning this masterpiece into a computer work-of-art falls to Creative Materials Ltd, a Manchester based-company with much experience in computer games design. At this stage they're being very tight-lipped about what they have in store, but they told Games Week "It's not going to be a simple boring shoot-'em-up." And we're all remarkably glad to hear that, aren't we? More news on this subject, as soon as we can convince US Gold and CML to "spill the beans". If you could just give us a hand with this horse's head. ■

TOP 10 SIXTEEN-BIT GAMES	THIS WEEK	LAST WEEK	CHART WEEK	TITLE	PUBLISHER	MACHINE
	1	3	11	Final Whistle	Anco	ST AG
	2	1	16	Fantasy World Dizzy	Codemasters	ST AG
	3	5	16	Speedball 2	Mirrorsoft	ST AG
	4	4		SWIV	Storm	ST AG
	5	2	5	Little Puff	Codemasters	ST AG
	6	RE	19	Forgotten Worlds	Kixx	ST AG
	7	8	36	F-19 Stealth Fighter	Microprose	ST AG PC
	8	NE	10	Steve Davis World Snooker	CDS	ST AG
	9	18	7	Super Grand Prix	Codemasters	ST AG
	10	7	7	Lemmings	Psygnosis	AG

ST = Atari ST AG = Commodore Amiga PC = IBM PC or compatible OT = Other
Chart compiled by Gallup. © European Leisure Software Publishers Association.



• Michael Corleone and his lovable, happy-go-lucky family are the subject of a forthcoming US Gold Godfather game.

GHOSTBUSTERS II

Amiga and ST

Here's a complete solution to *Ghostbusters II*, courtesy of Paul Waldren from Maidstone. Who ya gonna call?

LEVEL 1: As soon as you appear on screen, prepare to swing left and collect the first capsule. This contains part one of the slime-scoop. The next capsule is on the right. As you go down, you'll probably need to collect the bottle of courage and a shield for the bottom of the shaft. Shoot all the hands as soon as you see them, or they'll cut through the rope. When you are at the bottom of the level, collect the other part of the slime-scoop which lies at the bottom-right. If you didn't get a shield, go straight to the bottom and swing from side to side without firing. If you did collect a shield, just sit at the bottom of the shaft, activate the shield and cease firing too. An animated sequence carries the game over to Level 2

2: This is a fairly easy level, but you'll need some deft hand co-ordination. Get a friend to help with the spaceship – or grow an extra hand – but try to shoot down as many ghosts as possible whilst collecting all slime. Don't waste shots, as energy reserves deplete fast. Instead, concentrate on accuracy! And try not to ram the ghosts, as this doesn't help the energy situation either. Try to save enough energy for the big meenies which pop up at intervals during this level. Once you reach the museum, it's on to Level 3

3: First get all three of your men safely onto the floor. Then move them all onto the screen with the painting using the last man to collect the baby. Take the baby and drop him on the corner of the two boxes at the bottom-right corner of the screen. This should stop Vigo's

henchman from stealing him back again. Use a man with a slimer to deal with this character – he'll evaporate fairly easily when blasted repeatedly.

Then you face Vigo himself and you'll probably need two armed men to deal with him. The baby may have floated back to the altar by now, so go and collect him again. This time, place him on the centre of the white mat which is to the bottom right of the screen. If positioned correctly, he will stay there for the rest of the game. Vigo will meanwhile be wandering around the screen blasting merrily. Observe his movements carefully and prepare your two zappers. Cross your beams over a point which Vigo frequently passes and you'll get him. Repeat this operation until Vigo finally 'gets it'!

WHO YA GONNA CALL?

CYBERCON 3

US Gold • Amiga and ST • £24.99

At last, US Gold's much-talked about cyber-nightmare is upon us. *Cybercon 3* is a dark, scary world of even darker, scarier computer-madness. It's set in a futuristic world, where a giant computer system, known as the Cybercon, controls the country's entire military defence force. It's apparently been around for a while, and has undergone at least two changes of identity, but the third incarnation has developed a few irrational trains of thought. So much so that it's decided to exterminate all the humans it can lay its remote-controlled hands on.

Cybercon 3 resides deep inside a huge mountain, safe from enemy bombing. All entrances (bar one) to the mountain have been sealed off by a landslide which was engineered by *Cybercon 3* itself. In this virtually-impenetrable state, it sits, and thinks and plots the destruction of the humans.

And, surprisingly enough, this is where you come in. Although *Cybercon 3* is veritably a hard nut amongst the hardest of hard nuts, it must be destroyed. It does have one tiny design flaw which you may be able to put to your advantage. It has a vulnerable part – a brain stem, which control its central nerve system. If you can get in, blow up the brain stem and get out again, things might just be alright.

You start off in a dark corner of the big underground base, with a few token goodies to play with. The game is immediately tough on you, presenting you with a wealth of logic-solving and lateral puzzles, just to get your power-assisted suit working and then get the main door open. Assuming you can do this, you're then able to traverse the 400 or so rooms which make up the base. To begin with they're fairly uninhabited, with little to hinder you, but soon things start to hot up, as the Cybercon's own defence mechanisms start to track you down. The deeper you go and the closer you get, the tougher it is to stay alive.

A vital part of the exploration is the mastering of the use of the Sonic Key, a strange device which is able to interrogate doors and some objects in order to find out how they operate. Using a special shape and colour sequence, doors can be opened, remote-controlled cameras can be switched on and directed and a wealth of other technology can be made to work for you.

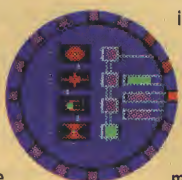
However, working against you are several other



• The original entrance to the Cybercon complex is now rubble and the bridge has been destroyed. That's why you've had to find a back way in. But will you ever get out alive?

factors. As you'd expect, your power suit is not infinite in its supply of power. When damaged, it takes a while to recover and recharge. This can be immensely dangerous, especially if you've been hit badly and are trying to run away. Then, the normally agile suit becomes so much dead weight, holding you back, making footsteps incredibly laborious. Getting out of the line of fire can be virtually impossible in this condition, and the only solution is to plan your route beforehand, avoiding the nasties. This takes several goes before you're able to build up a picture of the base's layout in your mind, and even then it's a dangerous affair.

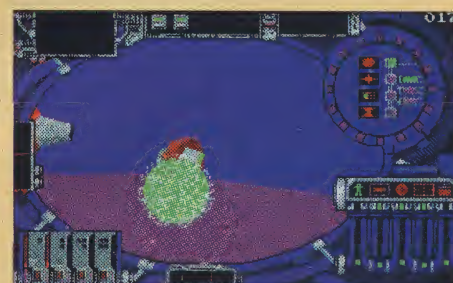
If vector-drawn 3D games light your candle even remotely, then *Cybercon 3* is for you. Its mimicry of the *Aliens*-type atmosphere – lots of darkened rooms, hidden surprises and deadly enemies – is superb. Vast chasms, transparent floors and miniscule walkways over deep abysses make for exciting gameplay and a lot of cold sweating too!



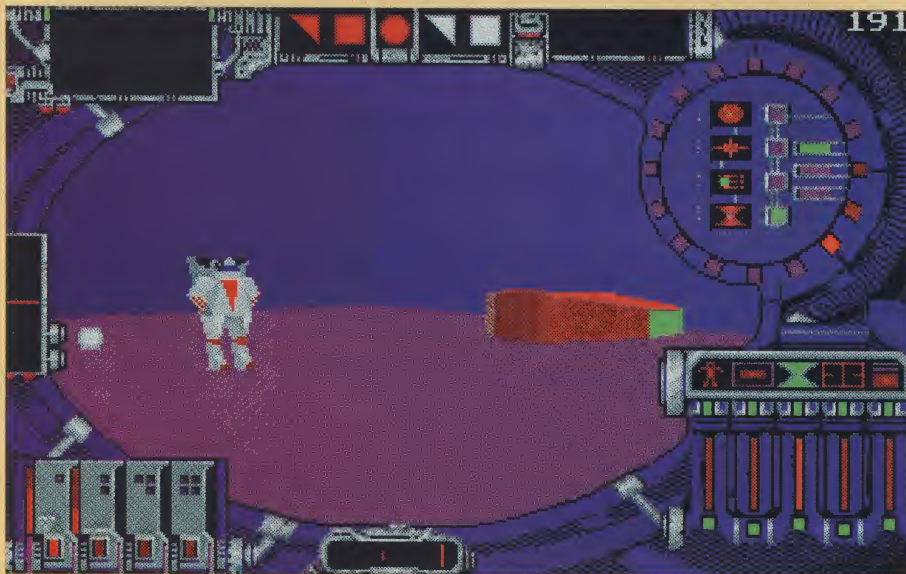
• Using the remote-controlled camera, you can see what you look like in the top lefthand corner of your suit display.



• Violent androids defend the base and many can trash your pressurised Power-Assisted suit in seconds.



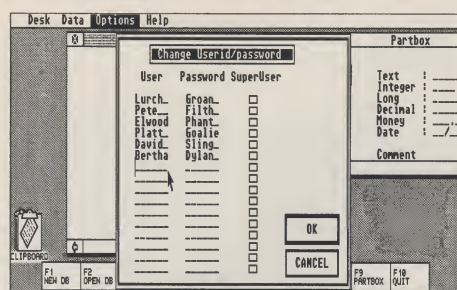
Being on the receiving end of a ball of plasma-energy is not fun. Cyber-wheels trundle around the complex, dealing death-blows if they spot you. Stand still and you might survive.



• Hidden inside Cybercon is a room filled with goodies. A spare suit, a bazooka and plenty of ammo are yours for the taking.

NEXT WEEK:

Gary Penn, ex editor of *The One* and 'a legend in his own right', takes over the controls of Games Week.



• Up to 16 passwords can be applied if you use the Adimens database in a multi-user environment.

If you are thinking of turning your ST into more than a games machine, as Atari would like you to do, then the first piece of software you will need is a sturdy database. At £129.99 you would expect the Adimens' to be just that.

The first word of warning is that the system is not the most intuitive program ever to have been written for the ST. The best advice is spend at least a couple of hours with the bulky and well illustrated manual before going near the program itself.

Half the problem when approaching the software is the scope of the work which it claims to be able to undertake. Functions from campsite management to patient analysis, via schedule monitoring and quality control are said, by the manual writers, to be "typical Adimens applications".

It is undoubtedly true that a wide range of applications are achievable by way of the system, it is just that, for the novice user of 'serious' software, the program is intimidating to get to grips with.

PARTS WORK

Setting up your first database is explained via a tutorial based on a campsite management system. You are taken through the basic of design and principles of a database in great detail. This is all well and good, in fact the depth of detail is to be praised, however it does become frustratingly pedantic. Adimens is crying out for a quick-start guide for those people familiar with the database principle, or eager to get started.

The system comprises three main program modules: EXEC.PRG, INIT.PRG, REORG.PRG.

EXEC is the heart of the matter. It allows you to input and process your data. All the basics lie within, you can enter, modify, delete, and of course search for data. As is now standard practice with database software, there is also a capacity to export data to other programs. You can also produce standard letters from

DATABASE DRIVING

Powerful with plenty of useful features, the Adimens database comes into its own both at home and in the office. Tim Smith gives this sturdy software his seal of approval.

this section.

INIT provides the basic structure of the database. The term 'mask' also crops up here; to most people this means the way in which the database will actually look on screen.

REORG, unsurprisingly is used to re-organise a database if, for example, you have deleted upwards of 20 per cent of the data. More importantly, it will also attempt to re-structure a database recovered from a corrupt disk.

Once you have got to grips with the basic concepts of these three files, it's time to leap in and create your database. Although we have said that this is a daunting task for the beginner, once it has been achieved, any number of options are open to you to manipulate data.

MAKE A DATA

The typical Adimens database is made of five subsidiary physical files:

.INX, .REC, .DFN, .DCL, and .LNK. On top of these is the main .DAT file in which information relating to the name of your database is held. Rather confusingly, no data can be held there. Within each of the five physical files, up to 32 logical files can be held, called 'logic files' in the manual.

The actual actions of these files are largely irrelevant, as most of the work is carried out in the background. The Adimens database does attempt to

make the good use of the ST's GEM interface, which allows most of the actual nuts-and-bolts work to be carried out beyond the sight of the user. For example, when re-organising a database using REORG, you, the user, can actually leave the machine to its own devices.

COMMAND PERFORMANCE

The Adimens database is theoretically capable of storing some 16Mbs of data. It achieves this by packing the data. In order to facilitate rapid searches and sorts, Adimens makes use of 'key features'. The maximum number of key features per database is 192 – and every file, or group of records, must have at least one key feature although no more than 63 key features can appear in any single file.

Passwording is also available. If the system is to be used in a multi-user environment then up to 16 passwords can be applied.

Field names can contain up to 30 characters. However, the total number of letters to be used in field naming cannot exceed 8,191.

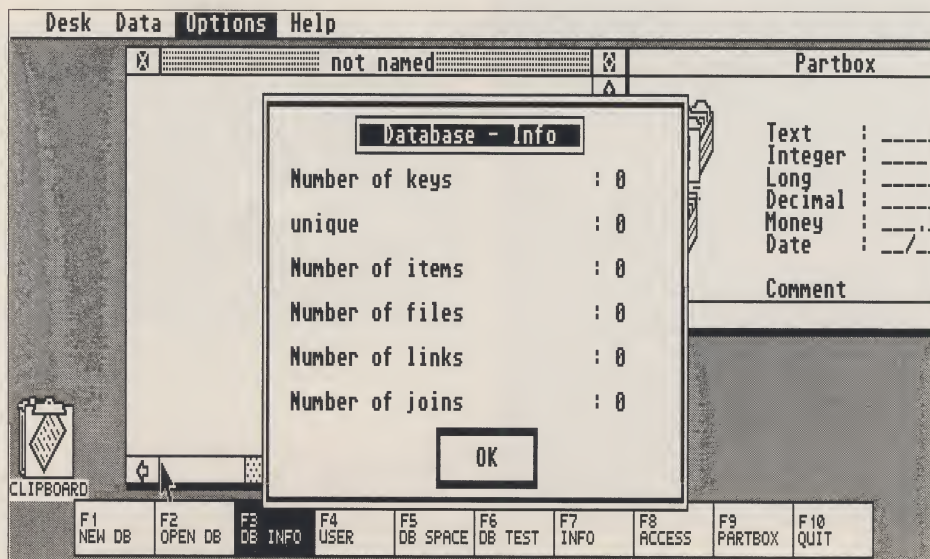
Up to 65,535 records can be stored within each of the 32 logical files which are contained within the main database. Obviously this figure far exceeds the needs of most single users with 1Mb machines.

Basically, for the home user, this database exceeds any demands which could be made on it.

AND FINALLY

There are plenty of moans to be had about the initial approach to working with this database; it is intimidating and over detailed at first. However, once you have got to grips with the principles of the software, the terminology and use of the files, it offers immense scope and several highly useful functions such as the ability to produce forms, printed reports and easy back-ups.

The system is aimed primarily at the 'power user', hence the references to multi-user systems, passwording and so forth. But there is no reason why a club or group of people with a common interest should not be able to get the most from the it. Not thoroughly recommended to the home user who merely wishes to catalogue his/her stamp collection, unless it is the biggest stamp collection in the West that is. But for the user or users who require a sturdy database with plenty of features to be discovered and put into practice, Adimens gets the seal of approval. ■



• Setting up your own database is made easy by simple to follow commands.

Adimens GT/GTI Relational Database. ADI Software. Distributed by Kuma Computers. Tel: 0734 844 335 It costs £129.99 (£132.78 from May 1)

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Kick Off II.....	£18.99	£18.99	£18.99
Lemmings.....	£18.99	£18.99	£22.99
M1 Tank Platoon.....	£22.99	£22.99	£29.99
Monkey Island.....	£18.99	£18.99	£22.99
Midwinter.....	£22.99	£22.99	£26.99
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The last decade saw an explosive growth in the personal computer market which has only just begun to slow down over the last couple of years. And then, just as demand and supply both began to cool, along came the portables, precursors of the most active sector of the world market; the notebook computer.

Unlike the early 80s though, this resurgence is due almost entirely to Japanese innovation and market penetration. For although both IBM and Apple, prime movers of the 80s' technological surge, have recently joined the fray with announced notebooks, they are both heavily reliant on Japanese technical know-how. More than that, they both use Pacific Rim components in the hearts of their new machines; one could argue they merely badge Far Eastern products after designing firmware and overseeing quality control. But perhaps this is going too far. Let's face it, it's American, and to a lesser extent, British, technical design knowledge you'll find at the core of any Japanese machine. But it's Japanese companies that are forging new markets and introducing new innovations on what seems to be an almost monthly basis.

Whatever, some estimates predict that by 1995, the world market for transportables, laptops and notebooks will exceed \$600m, with the notebook market set to soar at a 100 per cent annual growth rate starting this year. Conversely, the laptop market is currently expanding at around 30 per cent, with transportables or luggables at 17 per cent. Although portables account for only 12 per cent of the 24 million PCs shipped in 1990, this is set to rise to 20 per cent of the 36 million boxes expected to be shipped in 1994. One company more than any other has contributed to this predicted growth - Toshiba.

PORTABLE DEFINITIONS

TRANSPORTABLES: Typified by machines like the Osborne and early Compaqs, these luggables are designed for moving between home and office in the back of a car. With integrated monitor, keyboard, CPU and mains power unit, they are the equivalent of bringing home the office - literally.

LAPTOPS: Generally thought of as weighing more than seven pounds, laptops utilise a clamshell design, incorporate LCD screens and can be powered by batteries.

NOTEBOOKS: Weighing less than seven pounds, notebooks are around the size of an A4 sheet of paper or smaller and include all the features of laptops including hard disks.



• Toshiba's latest 3100 - the first mass market portable.

NOTEBOOKS

Will we all be using notebooks in a few years time? In the first of a two part special, Express looks at the future of computing on the move and asks: Where is it going?

HEY TOSH!

Although, this now Japanese giant only began to produce volume sales of its portables in the US and Europe in early 1989, its machines, in essence 'small footprint' desktop computers, now account for 14 per cent of the world market; ahead of Compaq at 11 per cent and NEC at 10 per cent. While its early luggables like the 16 pound 3100 series are now real dinosaurs, they got the whole sector moving - literally. But the real breakthrough came with the launch of Toshiba's Dynabook in Japan, a notebook computer which was the first IBM compatible to be released for the Japanese domestic market; hitherto all PCs there ran on the proprietary Nippon Electric standard. Its success was astronomical; catapulting Toshiba to market leader in less than a year and provoking a rash of competition among other Nippon manufacturers. The result is a burgeoning domestic market, late to start yes; with sales only half that of the US in 1989, but estimated to be 60 per cent greater than the US by 1994; comprising just under half of the entire world market.

In Europe, things are a little quieter. International Data Corp, a leading market research consultancy, predicts that by the end of this year 1m portables will have been sold; that figure only doubling over three years. So it will be a long time before portables are anything like commonplace. Most of that growth is expected to take place in the notebook sector of the market as the combined availability of smaller components, improved screens and longer battery life take its toll.

The key to the growth of the market is this. Whereas laptop portables are perceived as replacements for desktop products, notebooks are increasingly being seen as compliments. But although Toshiba, which has 35 per cent of the portable market in Europe is the clear market leader, competitors Compaq and Zenith are rapidly increasing their market share from 15 per cent and 12 per cent respectively with the introduction of their new notebooks.

Homegrown competition from the likes of Amstrad,

Pision and Husky, while geared towards more and more miniaturisation is largely reliant on either imported technology or relatively expensive local produce.

Meanwhile in the States, the hardware war is heating up with the expected arrival this year of notebook PCs from both IBM and Apple. Leading market research company Dataquest reveals that laptop and notebook sales have quadrupled in less than two years with Toshiba and Compaq vying head to head for the lead. For the rest of the year, demand will exceed supply. Compaq for instance has a six month book of back orders; it just can't make those laptops fast enough. And that's despite the obvious shortcomings of a large number of portables compared to their desktop equivalents.

// Japanese power users really want removable, rewriteable optical storage //

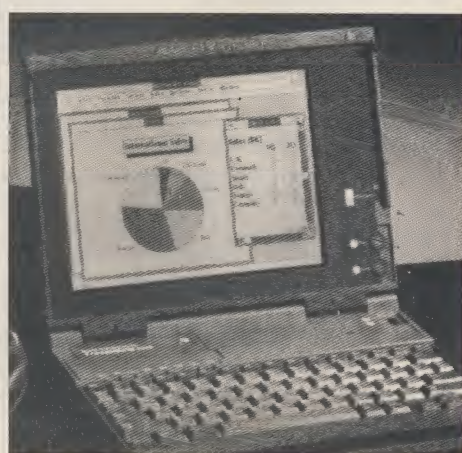
But while short battery lives, difficulties in file transfers, relatively poor performance and high price tags, will, arguably, always categorise the mobile market, it is perhaps folly to expect them ever to catch up with desktop technology. Three or four years seems to be the gap in relative power and performance, or at least that's the figure Compaq is on record as quoting. As such, one can only conclude that the notebook will never replace the desktop, but merely act as its complement.

SMALL IN JAPAN?

But what of Japan itself? The operative word there at the moment is 'Keihakutansho' or 'light, thin, short, small'. There are many reasons put forward for the late



• Sharp's 8501 colour VGA PC state-of-the-art in portability.



• Texas Instruments' TravelMate 2000 - a slab of a notebook.

S FOR THE NINETIES

liking of the Japanese market for all things PC and the recent drive towards Keihakutansho in computing technology. Some would offer cultural reasoning to argue that its because Western style desktop machines took up too much space, or even that large CRT screens hindered the eye contact essential in Japanese business life. More likely, though, is the difficulty in representing the Japanese language on screen.

Whatever the reason, portables are now seen as more of a part of everyday business life than in corresponding US and European circles. Indeed, the move away from luggables is slower than in the West in that manufacturers are realising that the true power user, able to afford a high performance machine, wants access to real storage. Not just a piffling 20Mb or whatever, but at least 100 and beyond. Moreover, in the end, he really wants removable, re-writeable optical storage. Otherwise, the Japanese businessman is buying notebooks; typically models less than 1 inch thick, and 11 inches long by 8 inches wide; Toshiba's T/J3100SE, NEC's 98 Note and Sharp's PC-6220 being top of the shopping list.

HOW LOW CAN YOU GO?

So where is the trend towards miniaturisation taking us and what, if any, are the boundaries?

Compressing components into a small hand-held requires state-of-the-art processes. Compaq, in designing its latest 386 notebook, the 4.75 inches x 6 inches x 1.5 inches LTE 386s/20, used technology employed in Cruise missiles and stealth fighters to 'fold' the machine's circuit board. While this machine may represent the current leading edge in functional portability, it's possible to go even smaller. The trade-off is, of course, between size, weight, power and convenience. The Poqet computer represents perhaps the smallest, fully functioning machine it's possible to deliver using current technologies. However, it has its problems and these have been reflected in sales. The display is not back-lit and the keyboard is unsuitable for touch typing, but unlike the Portfolios, Agendas and Organisers of this world, the Poqet does have full MS-DOS compatibility and the support of a over a dozen leading software houses releasing applications on memory card.

Otherwise the trend is to go for other options such as pen input and touch sensitive systems like the

GridPad, GO and Active Book projects or unplug-the-CPU solutions as offered by Ergo's Brick and Unisys's Power Port. These latter two designs are essentially for the executive who is looking for desktop performance wherever they may be.

However, given the trend towards the notebook what can we expect from the software that runs on it? The essential element here is the limitation poised by screen quality, processor power and storage space. Graphical User Interfaces like Windows 3 not only require at least EGA graphics cards but also 286 chips as a minimum.

So the trend is towards 386 machines with VGA displays capable of running all the usual desktop applications. But Toshiba has found that over 70 per cent of would-be portable users want a machine on which to word process. And, furthermore, these are the same purchasers who are going to be buying notebook in droves over the next few years.

So, the smart money is on producing slimmed down or 'Lite' versions of popular software packages

**//Whereas laptops are
perceived as replacements for
desktop products, notebooks are
seen as compliments//**

like WordPerfect's *LetterPerfect*, designed specifically for portables. Fully compatible with its desktop parents, these lite versions, whether they be spreadsheets, databases or word processors share formatting data, but omit unnecessary features like WYSIWYG.

But at the end of the day it really is just a question of what the buyer is prepared to pay. By the end of this year, you'll be able to buy a 386 portable with 800Mb hard drive. You can already go out and get yourself a Sony NeWS Unix portable workstation. Here you have all the power and performance a desktop is ever likely to offer. So perhaps, after all, the days of the desktop

LAPTOP LEANINGS

What is the main reason companies invest in laptops? The central thrust is the notion of 'automated' sales forces. Not only can sales pitches and figures be easily updated across a nationwide force, but by using portable technology at the point of sale companies can achieve an increase in the average value of each sale.

For the laptop computer is seen, primarily, as the objective arbiter. Its pitch is preferable to the patter of the salesman. The whole point is that it says exactly what you want it to say in the most convincing way possible; by using no words at all.

TECHNOLOGY ON THE MOVE

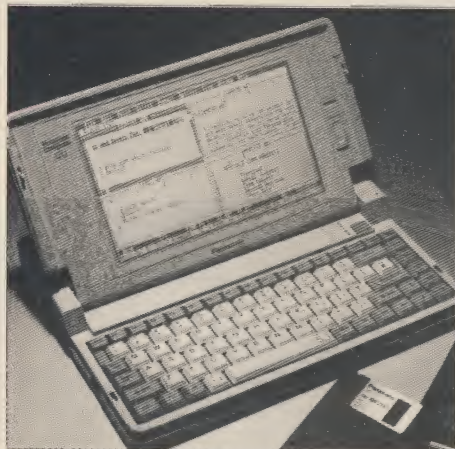
Storage for the new generation of lightweight Japanese notebooks takes the form of thin-profile high capacity hard drives capable of storing 100 Mbytes on a 2.5-inch disk combined with solid state memory devices.

The Japan Electronics Industry Development Association (JEIDA) uses credit card sized EPROM memory cards which are rapidly becoming the de facto standard. Epson and Toshiba have joined the club; so has IBM.

Notebook screens are wholly liquid crystal based with devices developed by Sharp, Toshiba and Hitachi forming the leading edge of thin film transistor displays. Both 14 and 16-inch true colour models have been demonstrated running at a very high resolution.

But battery power handling remains one of the most difficult nuts to crack. Despite power-saving tricks like shutting down processors between key strokes, the period between re-charges is still very short; typically one to three hours being the norm. At the moment, the chemistries of lead acid and Nicad cells are competing; the former are heavier, but recharge more completely. For the future, manufacturers are working on Lithium based power systems - expensive but long-lasting.

are over. As unit prices drop, so the thinking goes, there'll just be portables and the mainframe servers you plug them into for upload/download. But for the foreseeable future, it's more of the same, only smaller. The race is on for the first portable 486. ■



• Panasonic's CF-170 Notebook - true lightweight portability.



• Machines like the MiniSport have made Zenith no. 3 in the world.



• The current ultimate notebook - Compaq's LTE 386s/20.

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Meanwhile we've taken a sneak-peek at the sequel, *Turrican*

II. Pwheeeee, what a monster! So to add a little more spice to the competition, one of the lucky winners – chosen almost entirely at random – will get our review copy of Rainbow Arts' mega-follow-up once we've weaned ourselves off it...

- 1) Which machines is *Turrican I* available on?
 - a) JCB, Tube train, and electric toothbrush
 - b) Amiga, ST, C64, Spectrum, CPC
 - c) Mainframe, workstation, photocopier, Macintosh, blender
 - d) Microwave, laser, fax, Archimedes and cooker
- 2) Which software company publishes *Turricans I* and II?
 - a) Microsoft
 - b) Digital Research
 - c) Rainbow Arts
 - d) Woman's Realm
- 3) How many pins in a standard Amiga joystick connector?
 - a) 5
 - b) 6
 - c) 15
 - d) 9
- 4) Which of these games is in the Amiga Hot 100 of all time
 - a) Desk Croquet
 - b) Porky Pig's Backgammon
 - c) *Turrican I*
 - d) Pocket Billiards II
- 5) Which of these games originated in the USSR?
 - a) Gorbachev's Lubianka Simulator
 - b) Ivan the Runcible
 - c) KGB Attack Chess
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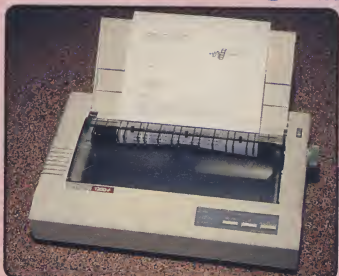
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To: Silica Systems, Dept NCE-0391-54, 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX

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